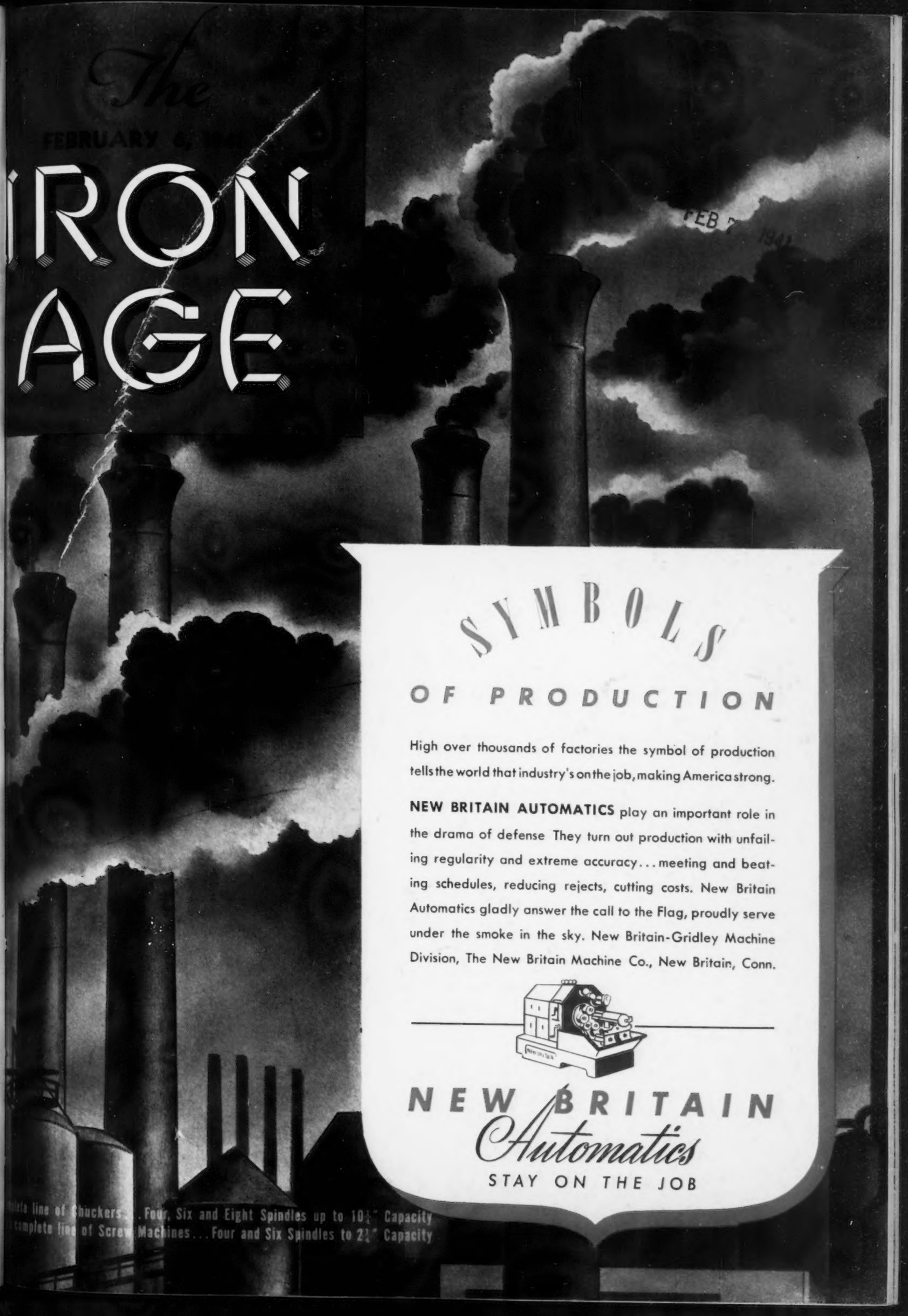

The
FEBRUARY 6, 1941
IRON AGE
FEB 1941
SYMBOLS
OF PRODUCTION
High over thousands of factories the symbol of production tells the world that industry's on the job, making America strong.
NEW BRITAIN AUTOMATICS play an important role in the drama of defense They turn out production with unfailing regularity and extreme accuracy... meeting and beating schedules, reducing rejects, cutting costs. New Britain Automatics gladly answer the call to the Flag, proudly serve under the smoke in the sky. New Britain-Gridley Machine Division, The New Britain Machine Co., New Britain, Conn.
NEW BRITAIN
Automatics
STAY ON THE JOB
Four, Six and Eight Spindles up to 10¼" Capacity
Four and Six Spindles to 2¼" Capacity

NEW INDUSTRIAL DICTIONARY

Sixth revised edition

In these swift-moving times, old ideas and definitions are changing. Our broad contact with industry may help you interpret the new meanings–to your profit.

char'ac-ter—the invisible element you should look for first, in buying machine tools; base, foundation on which tool and its value to you rest.

fu'ture—later period when cheap foreign labor will attempt to destroy American standard of living. Protection: giving American workman better machines so he can produce more value for himself and everyone.

in-fla'tion—disease fatal to everyone. Only antidote: better use of labor and capital by more efficient machines, to turn out more goods at fair prices.

mag'ic—that result which comes from modernizing with new, fast, powerful machine tools.

pa'tri-ot—a man (workman or manager) who is willing to *work* for his country instead of just talking about it.

prof'it—(elusive term). Difference between selling price and costs. Can be preserved by reducing costs (for instance, new Warner & Swasey Turret Lathes and tools cut turning costs as much as 50%).

re-ar'ma-ment—the most important, vital job you and we ever had. The one greatest *must* of all time.

spot—the place Management is on. Surrounded by government demanding higher taxes, labor demanding higher wages, the nation calling for more production, experience demanding caution. All four can be met by more efficient machines which increase production at lower costs.

tax—insidious growth, often deadly. Cure: reduce waste, lower costs by use of modern machines.

WARNER & SWASEY
Turret Lathes
Cleveland
YOU CAN TURN IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY

This Week in The Iron Age

o o o

FEBRUARY 6, 1941

VOL. 147 NO. 6

o o o

J. H. VAN DEVENTER
President and Editor

C. S. BAUR
Vice-President and General Manager

C. E. WRIGHT, Managing Editor — J. A. ROWAN, News Editor — T. W. LIPPERT, Technical Editor

F. J. OLIVER, Machine Tool Editor — G. RICCIARDI, Associate Editor

F. J. WINTERS, Art Editor

Washington Editors

L. W. MOFFETT — JAMES G. ELLIS

Resident District Editors

T. C. CAMPBELL, Pittsburgh — HERMAN L. KLEIN, Chicago

D. R. JAMES, Cleveland — W. F. SHERMAN, Detroit

Editorial Correspondents

W. P. DEARING, Buffalo — ROBERT G. McINTOSH, Cincinnati

G. FRAZAR, Boston — CHARLES POST, San Francisco

HUGH SHARP, Milwaukee — JOHN C. McCUNE, Birmingham

F. SANDERSON, Toronto, Ontario — ROY M. EDMONDS, St. Louis

LEROY W. ALLISON, Newark, N. J.

Editorial

Who Is to Blame for Delay 31

Technical Articles

Steel Plant Refractories 33
Flame-Cut from Steel Blooms 37
New Trend in Precision Gaging 38
What Is Our Manganese Situation 42
Metal Spraying 46
Wedge Wire Screens Made in U. S. 51
Die Cast Mechanical Parts in '41 Cars 52
What's New in Plant Equipment 55

Feature Reports

On the Assembly Line 60
Washington News 64

News and Market Reports

News of Industry 70
Personals 97
Obituaries 99
Metal Working Activity 100
January Pig Iron Output 101
Comparison of Prices 102
Summary of the Week 103
The Industrial Pace 104
District Market Reports 106
Machine Tool Activity 112
Non-Ferrous Market 113
Scrap Market and Prices 114
Fabricated Steel 116
Reinforcing Bars 117
Iron and Steel Prices 118
Ferroalloys, Pig Iron Prices 123
Warehouse Prices 124
Sales Possibilities 126

o o o

Fatigue Cracks 68
Products Advertised 142
Index to Advertisers 180

Copyright, 1941, by Chilton Company (Inc.)

A. H. DIX, Manager Reader Service

o o o

Advertising Staff

Emerson Findley, Robert F. Blair } 621 Union Bldg., Cleveland
B. L. Herman, Chilton Bldg., Philadelphia
H. K. Hottenstein, 1012 Otis Bldg., Chicago
H. E. Leonard, 100 East 42nd St., New York
Peirce Lewis, 7310 Woodward Ave., Detroit
C. H. Ober, 100 East 42nd St., New York
W. B. Robinson, W. J. Fitzgerald } 428 Park Bldg., Pittsburgh
D. C. Warren, P. O. Box 81, Hartford, Conn.
Don F. Harner, 1595 Pacific Avenue, Long Beach, Cal.

o o o

Member, Audit Bureau of Circulations
Member, Associated Business Papers
Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 a year. Single copy, 25 cents.
Cable Address, "Ironage, N. Y."

Owned and Published by
CHILTON COMPANY
(Incorporated)

Publication Office
Chestnut and 56th Sts., Philadelphia, Pa. U.S.A.

Editorial and Executive Offices
100 East 42nd St. New York, N. Y. U. S. A.

o o o

OFFICERS AND DIRECTORS

C. A. MUSSELMAN, President
JOS. S. HILDRETH, Vice-President
GEORGE H. GRIFFITHS, Vice-President
EVERIT B. TERHUNE, Vice-President
J. H. VAN DEVENTER, Vice-President
C. S. BAUR, Vice-President
WILLIAM A. BARBER, Treasurer
JOHN BLAIR MOFFETT, Secretary
JULIAN CHASE, THOMAS L. KANE,
G. C. BUZBY, P. M. FAHRENDORF,
HARRY V. DUFFY — CHARLES J. HEALE

Rolling Steel DOORS

Typical of the service Mahon Steel Doors are rendering various types of industry is the installation in the plant of the Pfeiffer Brewing Company, Detroit, illustrated below.

WHATEVER THE DEMAND . . .

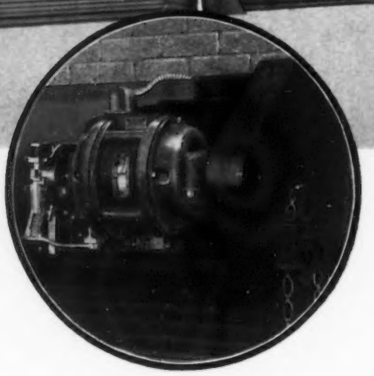
There's a MAHON Door to Serve

Of the many desirable and exclusive features of Mahon Rolling Steel Doors, flexibility of installation is an important consideration. Mahon Doors and Grilles are giving trouble-free service in all types of industrial and commercial structures—in hospitals, schools and other public buildings—wherever adequate protection from fire and burglary is essential. Installations are available for fire walls, elevator shafts or exterior openings, and can be made on the face of the wall or in the door opening. Doors may be both manually and electrically operated and are counterbalanced for easier operation. The expertly engineered interlocking slat construction, of copper bearing, galvanized steel, assures exceptional rigidity and lifetime service with little or no maintenance expense. Mahon engineers will analyze any door problem you may have and make detailed recommendations and cost estimates.

THE R. C. MAHON COMPANY, DETROIT, MICHIGAN

Representatives in Principal Cities

Manufacturers of Rolling Steel Doors and Grilles, Kalamein and Tin Clad Doors, Steel Roof Deck, and Cast Iron Roof Sumps



THE MAHON POWER OPERATOR

offers distinct advantages in design and construction. All gears are enclosed in an oil-tight gear box and run in a bath of oil. Power operating unit functions entirely independently of manual operating mechanism, and is so engineered that it may be completely removed and the door continued in service by means of the hand-operated auxiliary chain-gear.

MAHON

The Iron Age

o o o

FEBRUARY 6, 1941

o o o

ESTABLISHED
1855

o o o

Who Is to Blame for Delay?

THE "treasure hunt" is a popular game in some circles, but it cannot be called the universal American pastime because it does not appeal to everybody. One that does might be called "hunting the goat." When anything goes wrong or appears to be going not just as we expected it would, this game begins. Everybody hunts the goat. They always find one, but most often it turns out to be a sheep.

Probably there is no more enjoyable, self-satisfying, time-wasting and utterly useless occupation. It reminds me of a story.

Four or five young fellows went skating on thin ice and one of them broke through and fell in. Instead of all getting together to rescue him, the rest gathered in a circle to argue as to who was to blame for the accident.

"You were to blame," said Jack to Jim, "because it was you who invited him to join our party."

"You were to blame," said Jim to Jack, "because you chose this pond to skate on instead of another one."

"You were to blame," said Bill to John, "because you led us to this side of the pond where there are blow holes."

And so it went until poor Tom, the victim of the accident, gave up his hold in despair and drowned.

Recently I have heard the following culprits blamed for our not being able to perform miracles:

. . . *The Administration*

Congress

The Army and Navy

Mr. Knudsen and the Office of Defense Production

Mr. Hillman, Madame Perkins, the CIO and the AFL

The National Labor Relations Board

The Fifth Columnists

The Communists

The Machine Tool Builders

The Steel Industry

The Aluminum Industry

The Scrap Iron Industry

The Aircraft Industry

The Automobile Industry

I don't know why they left out The Iron Age and the roller skate industry. Perhaps, they were in the papers, too, but I missed them.

According to the catholicity of this list, there can't be many of us who are any good!

We might be better off if we stopped trying to be goat-getters and all concentrated on being go-getters.

Hundreds of special instruments and controls (like these in the open hearth department) are used throughout the Inland Plants.

Science, Teamed With Skill, Assures INLAND QUALITY STEEL

EVERY heat of Inland Steel is the product of science teamed with the skill of expert steelmakers. Inland research is constantly seeking better methods for producing special steel, so that when an Inland customer makes known his needs, Inland already knows the best method to produce the steel, its chemical and physical characteristics, and how it will perform during fabrication and in service.

High quality ore, coal and limestone are scientifically blended and measured. Inland engineers, working with America's leading consultants and equipment builders, have selected and supervised the construction of modern blast furnaces, open hearths, rolling mills and vital auxiliary equipment. Years of research and development are back of the extensive laboratory apparatus and the many special instruments used with Inland mill equipment for controlling pig iron and steel production, ingot heating, and the quality of products from rolling mills.

All of this vast background of scientific development, teamed with Inland expert steelmakers, assures maximum production of Inland Quality Steel.

SHEETS · STRIP · TIN PLATE · BARS · PLATES · FLOOR PLATES · STRUCTURALS
PILING · RAILS · TRACK ACCESSORIES · REINFORCING BARS

INLAND STEEL CO.

38 S. Dearborn Street, Chicago • Sales Offices: Milwaukee, Detroit, St. Paul, St. Louis, Kansas City, Cincinnati, New York

Steel Plant Refractories

By J. H. CHESTERS
United Steel Companies, Ltd., Stocksbridge, England

—Variations in refractories have a potent effect on steel production and quality. Therefore, this article is both timely and valuable in that it tells how to conduct tests and evaluate refractories, and lists data found to be most desirable in United Steel Companies' plants.

ALTHOUGH steel plants consume approximately one-half of all the refractories manufactured, which involves an expenditure of about $1.00 per ton of steel produced, relatively few plants have a refractories section in their research department and even fewer attempt to apply acceptance tests. In some works it is assumed that the quality of, say, the silica bricks used in open hearth furnace roofs is substantially constant and that troubles due to spalling or premature fusion must be the result of mis-handling of furnaces. And, at other works the refractories manufacturer gets blamed for many failures that have nothing whatever to do with the quality of his product.

Even where a refractories section does exist, it is all too frequently absorbed in explaining why things have gone wrong rather than in reducing the chances of such failures occurring. The testing work of a refractories section (as distinct from research and development) should have three main objectives, namely:

(1) The determination of the quality of refractories with a view of their acceptance or rejection. *Example:* Routine specific gravity determinations on silica bricks.

(2) The evaluation of new materials including the comparison of their properties with those of materials already employed, and consequent recommendations regarding rejection, modification or trial in a position consistent with the properties revealed.
Example: A dolomite brick may be found to compare favorably in properties with those at present employed, but it is only recommended for use in unexposed positions because its thermal shock resistance is particularly low.

(3) The explanation of difficulties arising in practice together with advice as to how these can be overcome.
Example: A silica brick that spalled in use is found on test to be abnormally hard-fired, and a slower rate of heating is therefore advised.

Time is an important factor in these investigations, particularly in those of the first and third categories, since unless the test data are available before the furnace rebuild commences, the opportunity of applying the information will have been lost.

Numerous examples will be given in the following sections of these different aspects of testing. The present section deals with the methods used in obtaining the test data referred to in subsequent sections, and with a comparison of these methods with those set out in the Manual of the A.S.T.M. Standards on Refractory Materials, (1937).* The methods used are based in part on those described by the Institution of Gas Engineers in their Publication No. 94 entitled "Standard Specifications for Refractory Materials for Gas Works," but they also include methods developed specifically for use with steel plant refractories.

A comparison of the methods used in testing refractories in various parts of the world emphasizes the desirability of setting up international standards. As an illustration of possible confusion, refractories have been arbitrarily defined as materials having a melting point of over 1500 deg. C., i.e., above Seger cone 18. In the American scale, however, cone 18 corresponds to 1490 deg. C. (2714 deg. F.).

For the testing of steel works refractories, the following tests have been found useful:

Apparent porosity.
Bulk density.
True specific gravity.
Cold crushing strength.
Permeability to air.
After-shrinkage or expansion.
Cone melting point (pyrometric cone equivalent).

*Mr. Chesters has pointed out that certain of his criticisms of A.S.T.M. methods of 1937 should be subject to some modification—several of the standards have been altered and these changes will soon appear in a new Refractories Manual.—Ed

Refractoriness under load, (rising temperature).
Refractoriness under load, (maintained temperature).
Thermal shock resistance.
Slag resistance.
Microscopical examination.
X-ray examination.

With some bricks certain of these tests are omitted while with others additional tests are employed. Thus with fireclay bricks, the true specific gravity is rarely determined, whereas with chrome magnesite bricks all the above tests, together with a test for bursting expansion in contact with iron oxide, are desirable. With certain products, notably checker bricks, the thermal conductivity and specific heat are of importance and must therefore be included in the test schedule.

Porosity and Bulk Density

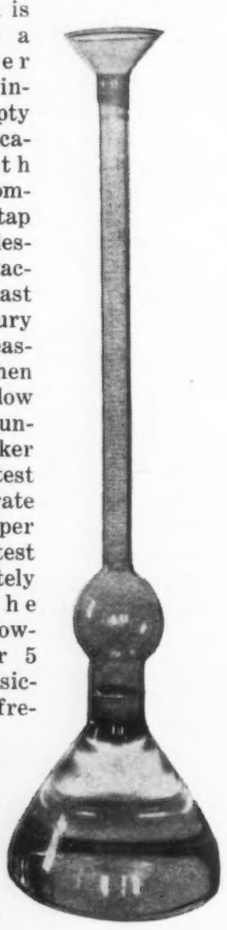
A representative piece of the test brick, devoid of skin and having as far as possible a rounded convex surface, is cut from the brick. The size of test piece is such as to weigh approximately 40 to 50 gm. The specimen is dried at 110 deg. C. for one hr., weighed to the nearest 0.01 gm. and this weight recorded as the "weight dry" (D).

This specimen is then placed in a 250 ml. beaker which in turn is inserted in an empty vacuum "desiccator" fitted with a mercury manometer and a tap funnel. The "desiccator" is evacuated to at least 28 in. of mercury and pumping ceased. Water is then allowed to flow from the tap funnel into the beaker containing the test piece at the rate of about 30 ml. per min. until the test piece is completely immersed. The specimen is allowed to soak for 5 min., the "desiccator" being frequently agitated to remove trapped air bubbles. After soaking, air is allowed to enter the "desiccator" and the beaker and specimen removed. Further water is added, if necessary, to allow the test piece to be weighed suspended in water. This latter weight is recorded as the "weight suspended" (S). The beaker with the specimen still immersed in the water is now removed from the balance, the test piece taken out, dabbed with a damp cloth to remove obviously excess liquid, and quickly weighed. This final weight is recorded as the "weight soaked" (W). The per cent porosity is given by the relation:

$$\text{porosity} = \frac{W-D}{W-S} \times 100$$

The bulk density is defined as $\left(\frac{D}{W-S}\right) \times \rho$, where ρ is the density of water.

The value $\frac{D}{D-S}$ sometimes referred to as the apparent specific gravity, is of interest, since with a silica or basic brick it gives an approximate value for the true specific gravity, while with a fireclay brick it enables an estimate to be made of the percentage of closed pores.

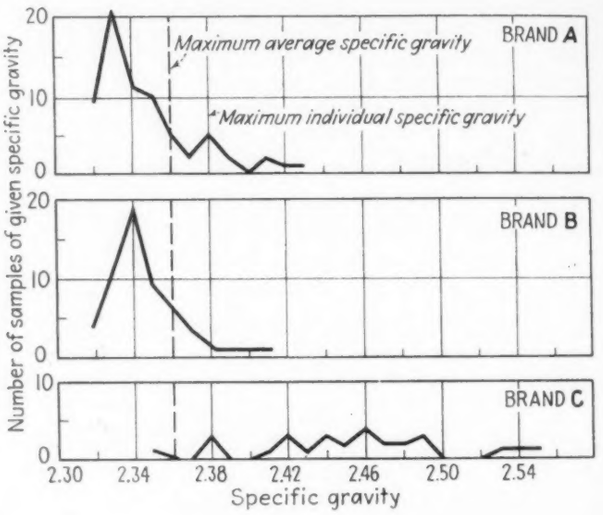


AT LEFT

FIG. 1 — Rees-Hugill flask used for routine determinations of the specific gravity of silica and magnesite bricks.

AT RIGHT

FIG. 2—Variations in specific gravity of silica brick deliveries over a period of nine months.



The A.S.T.M. test (designation C20-33), is esentially similar to the above, except that the test piece is only weighed to 0.10 gm.; and instead of evacuating, the test piece is boiled in distilled water for two hr. The result obtained in this way agrees closely with that given by the Central Research method.

In general, the porosity of a refractory brick lies between 20 and 30 per cent. With special care in manufacture, much lower porosities, e. g., 12 or 15 per cent, are obtainable. However, it should be noted that the porosity, like most of the other results, can only be interpreted in relation to the test data as a whole. Thus, with certain types of brick, the insistence on a low porosity might result in serious limitations, e.g., low thermal shock resistance.

True Specific Gravity

In general the method employed is essentially similar to that described in the A.S.T.M. Standard (designation C20-33), i.e., the specific gravity is obtained by crushing the portion of the dry test specimen to powder passing a No. 120 sieve and determining the displacement in water at 25 deg. C. and a 24 in. vacuum, of a 20 gm. sample in a 50 ml. pycnometer.

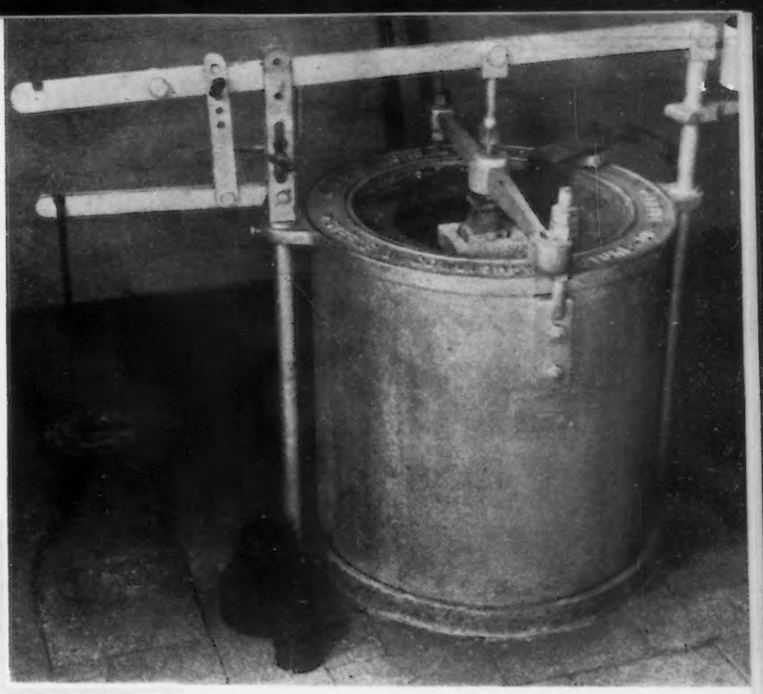
Routine tests, particularly on silica bricks, are done with a Rees-Hugill flask, as shown in Fig. 1. The flask is filled with xylene to a graduation mark and allowed to assume room temperature. One hundred grams of the test brick are ground to pass a No. 25 B.S.I. sieve; particles of iron picked up during crushing being removed with a magnet. The level of the xylene is adjusted so that the meniscus coincides precisely with the graduation mark and the 100 gm. introduced a little at a time by means of a spatula. Care must be taken to avoid contact of the hands on the body of the flask, since otherwise serious errors will be obtained due to the expansion of the xylene. When the whole of the powder has been introduced, the specific gravity of the material is read off on the stem. For magnesite bricks a similar flask having a thinner neck is employed.

The curves given in Fig. 2 show the type of data obtained from routine tests on deliveries of silica bricks over a period of about nine months. It will be seen that whereas certain manufacturers are able to deliver a consistently fired product, others allow the specific gravity of their bricks to vary over a wide range. Since the only satisfactory method yet found of obtaining consistent specific gravity bricks from periodic kilns, is hard-

o o o

FIG. 4 — Set-up for the determination of refractoriness under load.

o o o



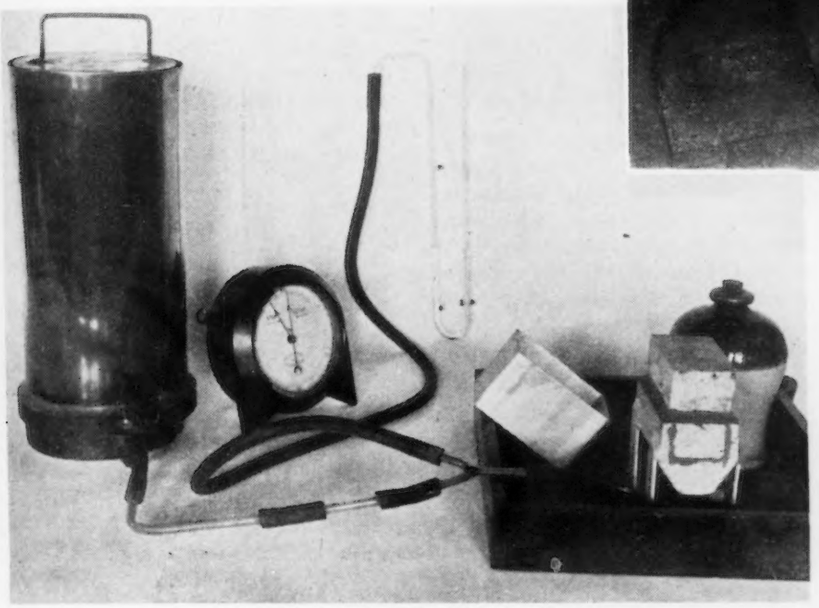


FIG. 3—Apparatus for the determination of the permeability to air of refractory materials.

firing, and since the other properties of such bricks are at least as good as those of soft-fired bricks, a maximum specific gravity for an individual brick of 2.38 and a maximum average for the consignment of 2.36, is specified for certain purposes, e.g., open-hearth furnace roofs.

Cold Crushing Strength

In the A.S.T.M. test (designation C133-37T) the crushing strength is determined using a complete brick (9x4½x2½ in.) and applying the pressure to the 4½x2½-in. ends. The ends of the brick are first faced up with shellac and plaster of Paris, or if the shape of the brick is good, cellulose fiber wall board is employed between the brick ends and the bearing blocks. The top bearing block should have a spherical seat which must be kept thoroughly lubricated to insure accurate adjustment. The speed of the head of the testing machine during the application of the load shall not be more than 0.5 in. per min. up to a pressure of 500 lb. per sq. in., while above this pressure it shall not exceed 0.05 in. per min. Most of the crushing strengths quoted in the present tests were determined by a similar method using 9x4½x3-in. bricks and a maximum rate of strain of 0.03 in. per min. The American test specifies that at least five bricks shall be crushed and an average value obtained. This is by no means always practical since in development work the number of bricks available is often small and a complete set of tests is normally carried out on three bricks.

In general, the cold crushing strength of refractory materials is quite adequate for the purpose for which they are required, but the insertion of a cold crushing strength clause in an acceptance test is sometimes useful, e.g., with chrome-magnesite bricks or with blast furnace bricks, to insure the elimination of crumbly material.

Permeability to Air

Although the precise significance of permeability to air is by no means clear, the carrying out of this test is generally worth while since together with the porosity it provides a picture of the texture of the brick that is valuable in considering probable slag resistance. The test piece employed is that used subsequently for the refractoriness under load test. Its dimensions are 3½x2x2 in., and the air is passed through a 3½x2-in. face. The apparatus used (Fig. 3) consists of a gasometer from which 1000 cc. of air can be forced through the test brick, and a holder in which the test brick is sealed with plasticine. A mercury seal is placed around it to avoid leakage via the sides. A manometer is attached to the holder just below the test brick and the pressure in cm. of water is read throughout the test run. The time taken for 1000 cc. of air to pass through the brick is recorded. The permeability to air is then defined as

$$\frac{1000 \times h}{l \times b \times p \times t}$$

where h is the height of the specimen in cm.
l is the length of the specimen in cm.
b is the breadth of the specimen in cm.
p is the pressure in cm. of water as read by the manometer, and
t is the leak time in sec.

Two test pieces of dimensions 3x2x2 in. are cut from the brick, the

2x2-in. ends of the test pieces being ground as near parallel as possible. A line parallel to the long axis is drawn down the center of one side of the test piece and the length of the test piece adjacent to this line determined by means of vernier calipers reading to the nearest 1/1000 in. The test pieces are placed flat on a suitable base in a gas-fired kiln, the marked surface being kept uppermost, and are then exposed to a given heat treatment. For silica or basic bricks this usually consists of 2 hr. at 1500 deg. C.; but, for certain purposes, a more severe test, e.g., 1 hr. at 1650 deg. C., is employed. For fireclay bricks, the usual schedule is 2 hr. at 1410 deg. C. After cooling in the furnace, the test pieces are re-measured and the per cent after contraction or expansion determined.

In the A.S.T.M. test (designation C113-36) a complete brick is employed, the following soaking periods being specified for fireclay bricks:

Intermediate heat duty, 5 hr. at 1200 deg. C.
High heat duty, 5 hr. at 1400 deg. C.
Super heat duty, 5 hr. at 1600 deg. C.

With silica bricks a knowledge of the after-expansion, which may vary from nothing to as high as 6 per cent, together with the specific gravity and thermal expansion data and the results of microscopic examination, enable an idea to be gained of the expansion allowance that must be made in practice. For coke ovens a maximum per cent linear change after reheating is generally specified, but for steel works, bricks of greatly varying after-expansion are employed, and the value of the test lies in the adjustment of works practice to suit the particular materials available. With ladle bricks and basic refractories it can be stated broadly that the contraction on re-firing (2 hr. at 1500 deg. C.) should not be greater than 1 per cent, since otherwise joints will tend to open up and premature failure due to spalling or slag attack occur.

Pyrometric Cone Equivalent

In general the cone employed in determining the refractoriness values given in subsequent sections has a triangular base of ½ in. edge and a height of approximately 2 in. Wherever possible the test cone is cut from the brick and not made by molding crushed material as in the A.S.T.M. test (designation C24-35). The difference is important since with certain materials, e.g., the used face of an open hearth roof brick, there may be a difference in melting point of as much as 40 deg. C. according to the method employed. This is not surprising since crushing of the brick destroys the texture and alters the distribution of the fluxes. Since in practice the bricks are not crushed, it is desirable that they should be tested in a way that will take account of their texture. The test cone is surrounded by small Seger cones selected so that their refractoriness will be slightly above and slightly below that of the test cone. The rate of heating above 1000 deg. C. is approximately 10 deg. C. per min. and the end point is taken as the temperature (as shown by the condition of the Seger cones) at which the tip of the test cone is on a level with the base. In general, optical pyrometer readings are also taken and these should check within 10 deg. of the value given by the Seger cones.

The A.S.T.M. test is markedly different, not only because the material is ground to pass a No. 65 Tyler mesh sieve, but because the cones, instead of being set with one face vertical, are set at an angle of 82 deg. to the horizontal. Moreover, the test cone is only 1 in. in height and has a 5/16-in. base.

Refractoriness Under Load

Rising Temperature Test: In general the test piece used consists of a 3½ in. (or 3 in.) x 2 x 2-in. block. It is supported on silicon carbide blocks in a Hirsch carbon granule furnace and a load of either 28 or 50 lb. per sq. in. is applied by means of a second set of silicon carbide blocks and a suitable system of weights and levers. The general arrangement is shown in Fig. 4. In setting up the column it is important that the blocks be varied so as to permit of a movement up or down of at least ½ in. without interference. The change in length of the test piece during the run is recorded on a rotating chart by means of a system of levers giving a magnification of ten. The furnace is heated up at approximately 10 deg. C. per min. by varying the transformer tappings and the amount of resistance in series, until the test piece collapses, i.e., shears or becomes compressed by more than 10 per cent of its original length. The temperature at which the expansion of the system is just counterbalanced by the collapse of the test piece, i.e., the temperature when the curve becomes horizontal, is also noted and recorded as the "initial softening temperature." As a matter of interest the temperature at which the collapse becomes rapid (0.3 in. per min.) is also noted. These two values together with the temperature of final collapse give a useful impression of the pyro-elastic properties of the material.

Maintained Temperature Test: The result given by the rising temperature test can be very misleading since a brick that can safely be heated at 10 deg. C. per min. to, say, 1700 deg. C. may nevertheless collapse under the same load at 1400 deg. C. if maintained at that temperature for a few hours. Hence, for certain materials, notably port blocks or pillars that must carry a load at a soaking heat, a maintained temperature test is preferred. The equipment used is precisely similar, but on reaching 1400 deg., 1500 deg. or 1600 deg. C. the temperature is held constant and the behavior of the test piece noted. Thus, it may be observed that say X per cent deformation occurs after so many hours at a given temperature, or alternatively that failure occurs after only Y minutes at this temperature.

In the A.S.T.M. test (designation C16-36) a full brick is compressed on end and much longer heating schedules employed. Thus, with silica bricks, 6½ hr. are taken to reach a temperature of 1500 deg. C., while with a super duty firebrick 1450 deg. C. is reached in 4½ hr. This method of testing has certain obvious advantages, notably that it takes more account of such limitations in the brick as lamination, but on the other hand bricks in furnaces are rarely exposed to serious loading in the on-end position. The test load employed in the A.S.T.M. method is 25 lb. per sq. in. which is quite close to the D.I.N. value of 2 kg. per sq. cm. (28 lb. per sq. in.). The test result is expressed in terms of change in length measured on the cold test piece after a given heat and pressure treatment.

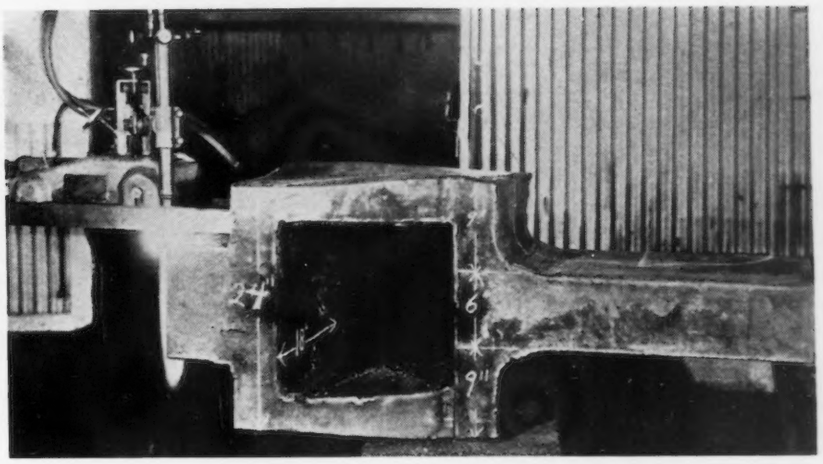
Ed. Notes—Next week the author concludes with descriptions of tests for thermal shock resistance, slag resistance, X-ray examination, etc.

Flame-Cut from Steel Blooms

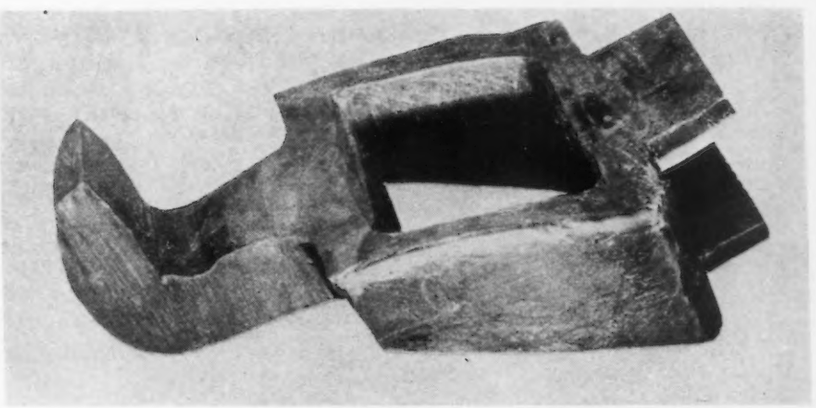
MOST steel men are familiar with the usefulness of oxy-acetylene machine cutting for simple cut-off operations or for cutting steel plate to shape. Here, however, are several examples of the manner in which heavy steel mill equipment parts can be flame-cut in three dimensions. This equipment—a large cinder hook for scraping soaking pits, and the crosshead for a shear—were flame-shaped directly from steel blooms.

The blooms were marked with chalk on two sides to the desired outlines and then cut to shape by cutting away the outline first on one side and then the other. A portable oxy-acetylene cutting machine was used to make the major cuts through the thick sections, and a hand-seaming blowpipe was used later to rough-shape the form more closely to the desired outline, round the edges, and make the trimming cuts. Openings were first drilled and then cut with the cutting machine.

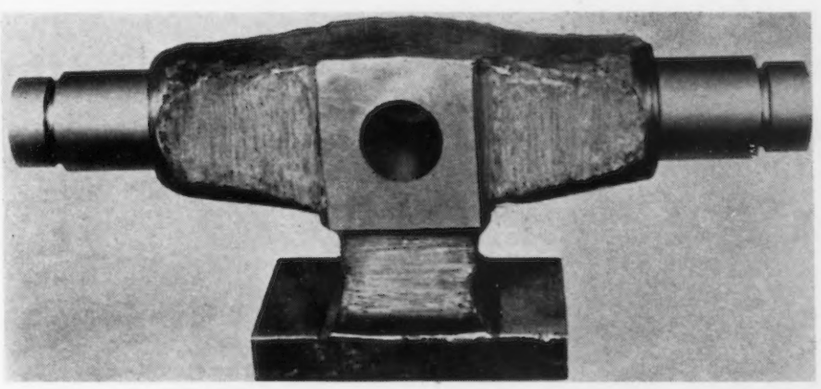
o o o



o o o HERE can be seen a large cinder hook being cut by a portable oxy-acetylene cutting machine from a single steel bloom.



o o o THE completed cinder hook is ready for service in the soaking pit of a large steel mill. Fabrication by forging would have been impractical due to its intricate shape.



o o o A SIMILAR flame-cutting application in the same plant was this crosshead for a 30-in. shear. Formerly this part was subject to frequent failure. Then it was decided to flame-cut it from a bloom of alloy steel. The first such crosshead flame-cut from S.A.E. 3250 steel, then normalized, has been in service since 1937.

New Trend in Precision

MECHANICAL gaging progress in the past decade has been expressed first of all in the development of more accurate and reliable gaging devices and instruments incorporating more easily read and interpreted types of indicators. Further, there has been a marked increase in the portability of instruments, as well as their ruggedness, which has encouraged their use in regular production checking.

These advances in the gage-making art have undoubtedly speeded the tendency to 100 per cent inspection of mass-produced parts as a final and absolute assurance of interchangeability. For many products manufactured in great volume, for instance those of the household equipment industries, automotive, and others, ease of assembly and ultimate performance have both been predicated on the possibility of maintaining a constant check on the greatly increased accuracy of millions of parts.

o o o

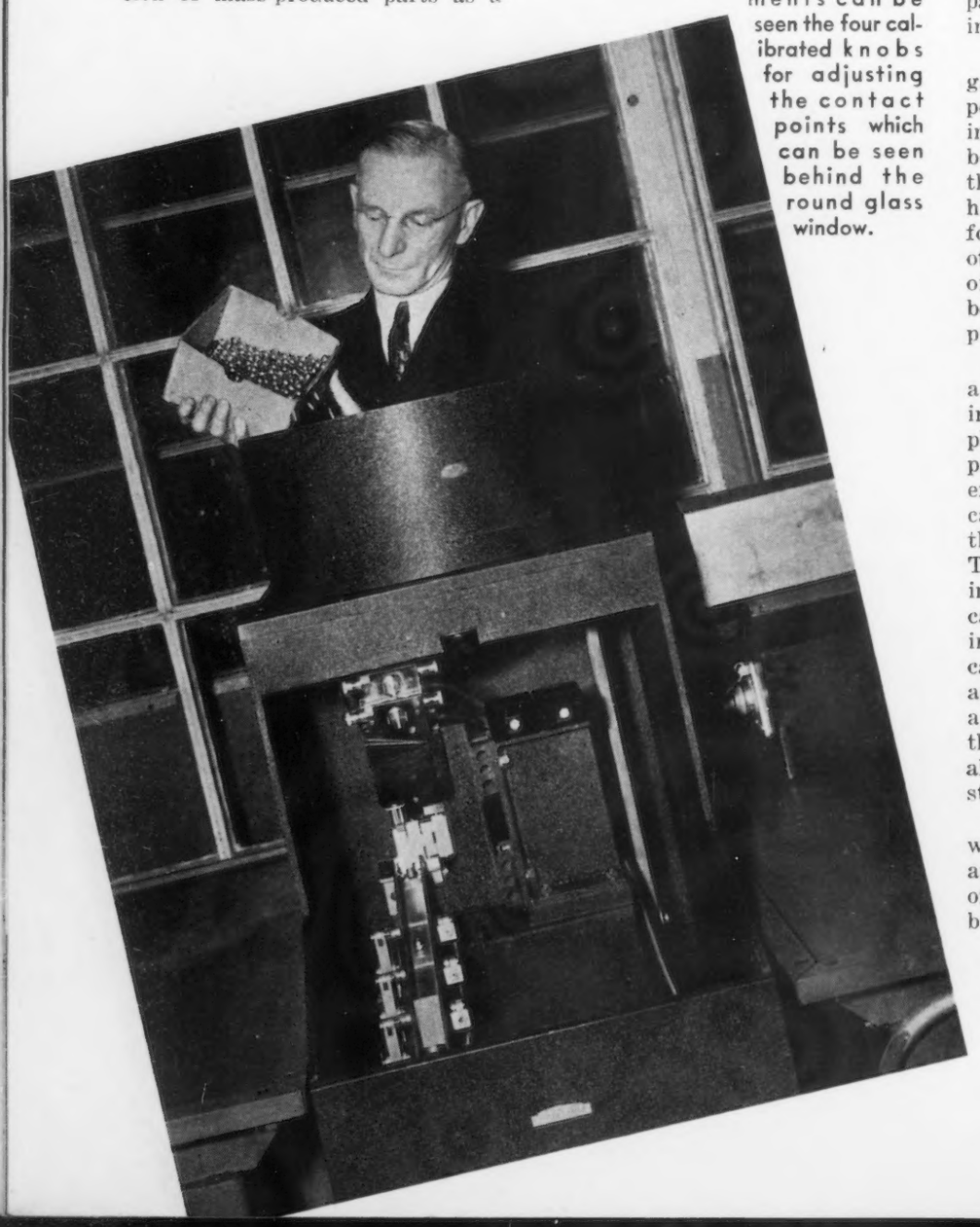


FIG. 1—Recent Ford installation to automatically inspect steel balls for bearings. The rotary hopper above and the receptacles below are rubber lined to avoid damage to the polished surfaces. Above the two reed elements can be seen the four calibrated knobs for adjusting the contact points which can be seen behind the round glass window.

Of necessity, the accuracy required for such volume interchangeability has been based almost wholly on the ability of gages to help in segregating the millions of parts into size classes, and classifications were by thousandths or even half-thousandths of an inch. Demands now are for increasingly closer tolerances, with tenths of thousandths becoming part of the every-day shop language in many plants.

Under these conditions, precision gaging has been called upon to perform many new services. Each increase in the usage of gages has been accompanied by advances in the science of gage making. There have resulted, for instance, some forays into automatic gaging and others, more recently, into the field of multiple gaging, which seem to be natural complements to mass production.

It cannot be said that there are a great many truly automatic gages in operation today, nor that multiple gaging as yet is a general practice, but the examples that do exist are important enough to indicate with some positiveness that there is a trend in that direction. The trend has been spurred along in the last 12 months, partly because the brand new armament industry is an ideal field for application of the most advanced ideas and techniques. The defense plants are tooling up "from scratch" and therefore can absorb the latest in all manufacturing practices in stride.

Some of the latest equipment which the gage maker has produced and planned for the streamlining of inspection methods is reviewed briefly herein.

The differentiation between automatic gaging and multiple gaging is clearcut. Automatic gaging machines, which have

Gaging

—A burgeoning armament industry is developing automatic gages and multiple gaging to streamline mass production.

By W. F. SHERMAN
Detroit Editor, The Iron Age

been a dream of the mass-production industries, may perform one or more of several functions. They may inspect successively a series of independent dimensions, passing only those which come within set tolerances. Or they may inspect only one dimension, passing or rejecting, as indicated. Or the machines may classify parts into any number of classifications, in accordance with carefully graded dimensions. Finally, an automatic gage may combine several of these functions.

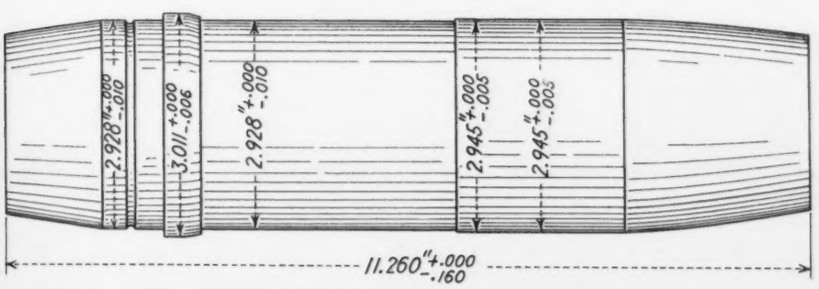


FIG. 2—This profile of a 75 mm. shell shows the critical dimensions and tolerances which must be checked.

o o o

RIGHT

FIG. 3—Multiple point checking of 75 mm. shells is carried out on this gage. For checking, the shells stand on the nose end, over a locator stud which is on a slide that carries it back to the gaging point. There are eight sets of gage points and, above, eight lights in a vertical column, one for each dimension being checked.

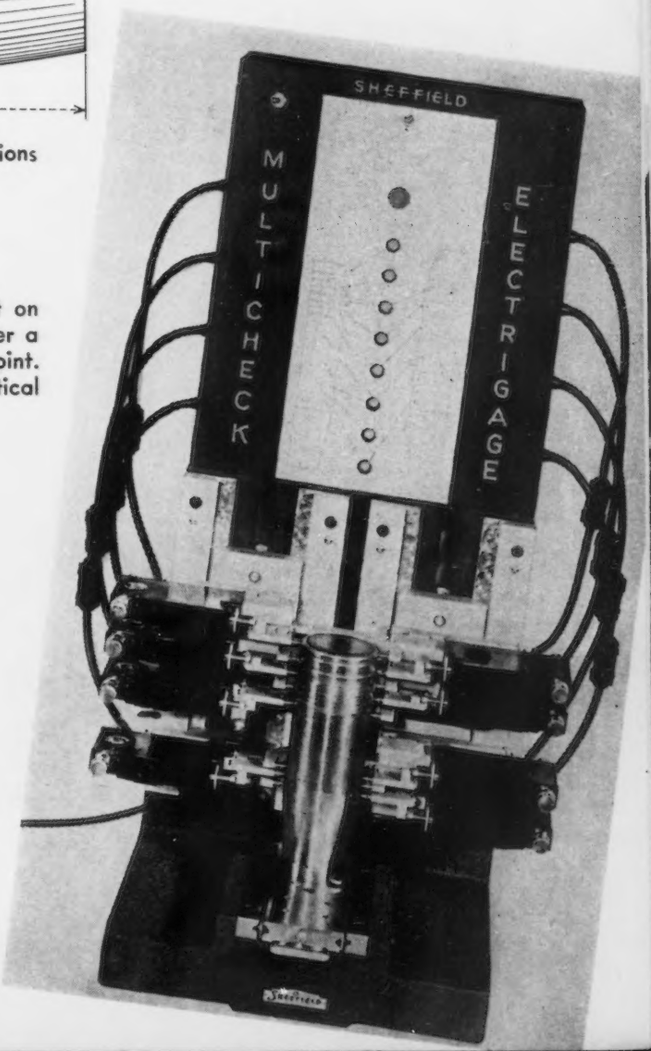
Multiple gaging has as its objective the simultaneous checking of a plurality of dimensions. It is carried to its most perfected form when the instrument checks a number of dimensions in several directions all at the same time, giving complete approval or rejecting the parts, as required, and providing the operator with the reason for each rejection. Multiple gaging conceivably could be automatic also, provided that complications were not introduced by demanding too much in the direction of classifying the parts or specifying in detail the reason for rejection.

Of the two, automatic gaging has the longer history, having been attempted innumerable times. However, the outstanding successful installations are not great in number. Attaining something that resembles historic significance are automatic gaging machines in use in Western Electric Co. plants for more than 12 years and described by C. W. Robbins in the "Bell System Technical Journal" for October, 1928.

This type of machine is hopper or magazine feed. In some cases the gages inspect as many as seven measurements per part, classifying each part into three groups, or 21 classifications in all. The feed rate is 60 parts per minute, so some 420 separate determinations of size are made each minute.

In service now at the Rouge Plant of Ford Motor Co. are four of the automatic gages for automobile valve tappets described in THE IRON AGE, issue of Nov. 18, 1937.

The most widespread use of automatic gaging has been for checking wire size or thickness of running strips of material. Among mechanical parts, balls for ball



bearings have probably been subjected to automatic gaging in more instances than can be found anywhere else in industry, the highly repetitive nature of the gaging lending itself to attempts to design automatic gages. In the ball bearing industry, the most pertinent

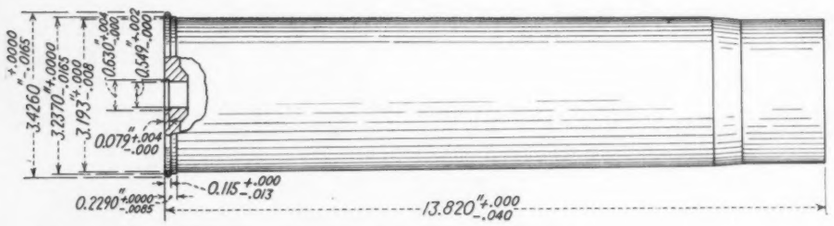


FIG. 4—A 75 mm. cartridge case which will be gaged for nine critical dimensions simultaneously—three outside diameters, three length measurements, the diameter of the tapered percussion cap hole, a counterbore diameter and depth of counterbore.

o o o

requirement is speed enough to accommodate the large volume production on a limited number of gaging units.

Probably the newest equipment for automatic sorting of balls according to diameter variation is a hopper-fed unit installed by Ford last spring. (Fig. 1.) Although adjustable for a variety of sizes and capable of being set to a tolerance as low as plus or minus 0.000005 in. (five millionths), it is used only on 15/32-in. balls and the gage is set for the acceptable tolerance of plus or minus 0.0003 in. It operates fast enough to gage 4200 balls per hr., about 2000 an hr. faster than the previous semi-automatic (tapered slot) method. It classifies into five groups—oversize, undersize, and three acceptable classifications, in increments of 0.0002 in. This gage makes use of two modern electric reed gaging heads, operating off a single contact point or gaging element. One of the heads serves to reject, and classify, the oversize and undersize balls; the other classifies those balls just above or below the mean dimension and also passes (classifies) the balls that are exactly 0.46875 in. in diameter. Relays open chute gates on an inclined plane to drop balls into compartments in the machine base.

The electric gage heads used in this ball checker, and in multi-point gages hereafter described, are a recent development of Sheffield Gage Corp., called Electrigages. In contrast with earlier similar units, each of these has a single tell-tale light unit as a visual indicator, eliminating the need for three lights and separate relays formerly used. Its single lens shows red, green or amber — for undersize, oversize and correct. Its compactness and the fact that only one lens need be watched for each dimension checked has made it possible to incorporate many of these units in a single machine for gaging numerous points simultaneously.

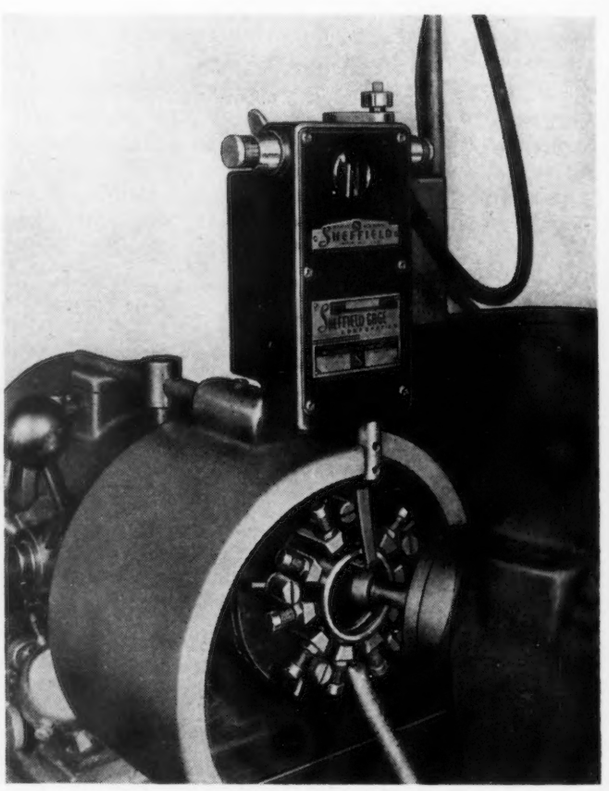


FIG. 5—Mounted on a grinder which grinds the internal diameter of outer races for ball bearings, this Electrigage unit stops the machine when the diameter comes within tolerance.

o o o

In multiple gaging, as has been indicated, the accent is on the plurality of checks made at one time. It is of especial significance that the various dimensions need not all be similar in nature. That is, some can be internal diameters, others external diameters, while still others checked at the same time may be measurements of length.

The multiple or Multicheck gages are new—mostly designed for use in arsenals within the last year. They are intended in most cases for checking a series of diameters, or diameters and lengths such as, for instance, shoulder lengths on shafts. Actual applications include armature shafts, timing fuse parts, shells, cartridge cases, etc. One light opening and one Electrigage head, including reed mechanism, are necessary for each dimension checked. The light unit can be mounted remotely from the Electrigage head and, where several dimensions are checked, it is the practice to mount the light units in a straight line, above or alongside each other.

A plan of the work is shown on the panel with the lights, and this plan indicates the dimension to be checked by each lens. If a certain dimension is oversize, its light shows green; if undersize, its light shows red, and if the dimension is within the tolerance, the same light shows amber. A combination of two light bulbs—red and green—and an opalescent lens makes possible the three readings on one spot.

In addition to the individual di-

mension lights, there is a master pilot lens which indicates to the operator whether all dimensions are correct, or whether one is incorrect. It is claimed by one user that an operator can check seven dimensions on a 75 mm. shell at the rate of 600 shells per hr. without eye strain. Tolerances as small as "half a tenth" (fifty millionths) can be readily checked this way.

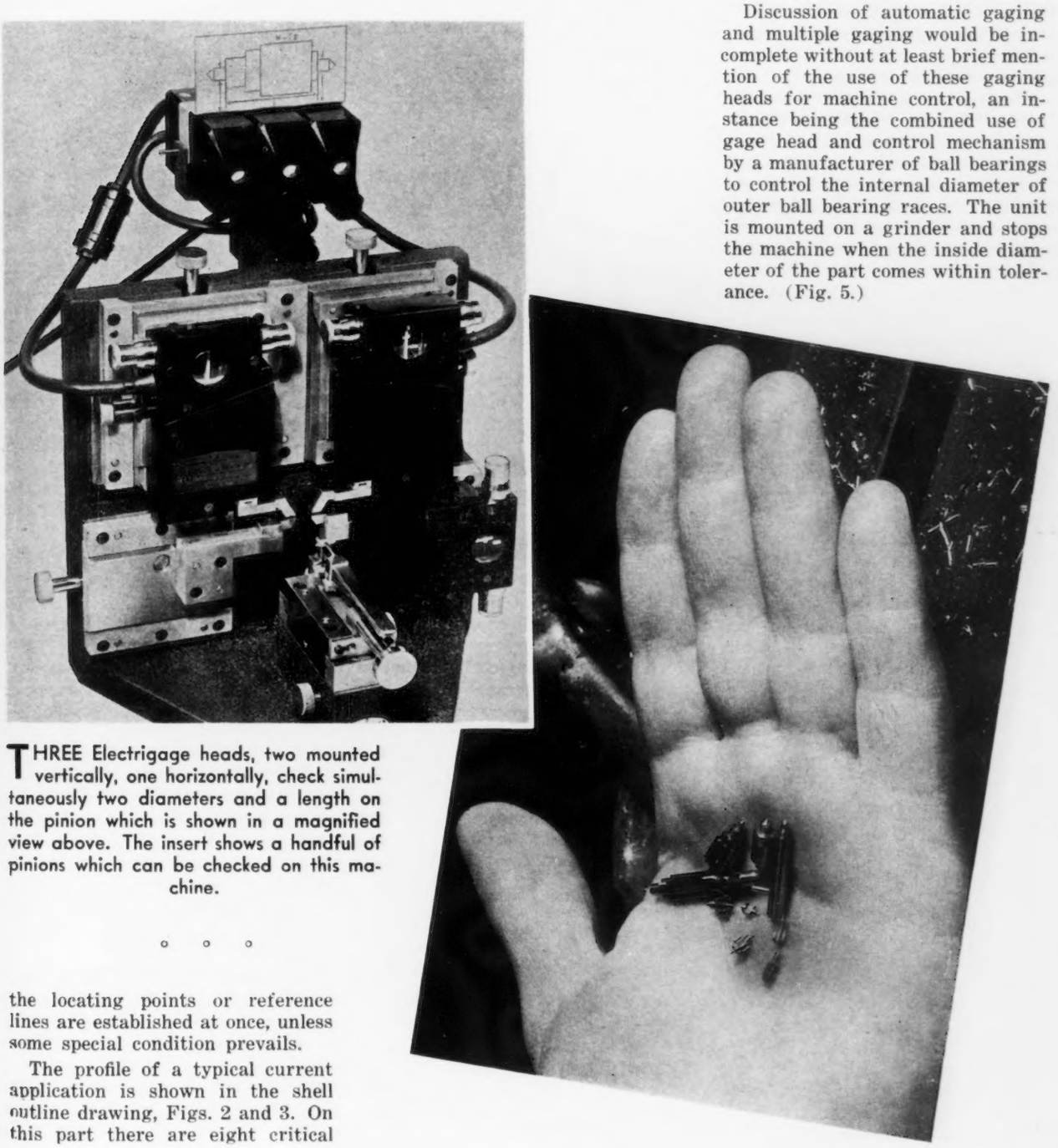
First point in favor of such a gaging set-up must be the fact that handling the piece need be done only once. In most instances, all of the locating points or reference lines are established at once, unless some special condition prevails.

The profile of a typical current application is shown in the shell outline drawing, Figs. 2 and 3. On this part there are eight critical dimensions, all diameters. Another application immediately in view is on a cartridge case where there are three outside diameters, three length measurements, the diameter of the tapered percussion cap hole, a counterbore diameter, and depth of counterbore to be measured simultaneously. (Fig. 4.)

Minute parts, such as a pinion less than $\frac{1}{8}$ in. long overall and less than 3/32 in. diameter, can also be measured on these Multicheck Electrigages. The diameters of both end trunnions of this pinion are measured for size, and at the same time the length of the pinion portion is checked. Incidentally, the units are adjustable to check several sizes of similar parts. Pieces such as these are so small that they cannot be checked satisfactorily in any other way.

Gages such as these are set either by use of master parts or the use of precision gage blocks to determine maximum and minimum values. Since each head retains its own individuality, it can, if desired, be dismounted and applied elsewhere if required.

Discussion of automatic gaging and multiple gaging would be incomplete without at least brief mention of the use of these gaging heads for machine control, an instance being the combined use of gage head and control mechanism by a manufacturer of ball bearings to control the internal diameter of outer ball bearing races. The unit is mounted on a grinder and stops the machine when the inside diameter of the part comes within tolerance. (Fig. 5.)



THREE Electrigage heads, two mounted vertically, one horizontally, check simultaneously two diameters and a length on the pinion which is shown in a magnified view above. The insert shows a handful of pinions which can be checked on this machine.

o o o

What Is Our

MILITARY men in the United States regard manganese ore the No. 1 strategic material, since about 14 lb. of this metal is required in each long ton of steel produced. Before the element is added to steel, its high-grade ores are converted into ferromanganese (average 80 per cent Mn) and the low-grade ores are converted into spiegeleisen (20 per cent Mn).

Inasmuch as most domestic manganese ores are low-grade, this country has an ample supply for its spiegeleisen needs. However, the United States has few deposits of ferro-grade ores averaging 45 per cent Mn or better, required to make the more important ferromanganese used to deoxidize and desulphurize steel and give it such desirable qualities as improved strength, ductility, and hot rolling properties. Manganese has no substitute at its cost for its uses in steel, which account for some 85 per cent of total domestic consumption of high-grade ores.

Important as ferro-grade manganese ores are to the steel industry, this country has been dependent upon distant sources for about 95 per cent of its needs. With Russia, the African Gold Coast and India sending some 70 per cent of the imports in recent years, the outbreak of the European war in September, 1939, stimulated the United States Government to rather belated action in accumulating a stock-pile of this mineral to prepare for possible emergencies that might interrupt supplies from the three major sources. In such event, imports from Brazil, Cuba and Chile, plus a small domestic output, would not meet the country's entire needs.

In recent months, Mediterranean hostilities between the British and Italian forces have sharply curtailed imports from Russia, which are shipped normally through that Sea. No manganese ore arrived here from Russia in September and November, 1940, and shipments during June, August and October had been far below earlier levels. Fortunately, considerable amounts of ore from South Africa have been diverted to the United States, due to the loss of the normal European markets for this output. Nevertheless, this country still remains uncomfortably dependent upon eastern hemisphere sources for some 75 per cent of its imports.

The United States consumption of manganese depends largely upon steel activity, and the rate of imports and domestic output of the ore have fluctuated generally in line with steel production.

In Table I, it may be observed that 1937 steel output of 56,637,000 short tons required some 750,000 long tons of ferro-grade manganese ores, whereas the indicated consumption reported by the U. S. Bureau of Mines plus the ore represented in imported ferromanganese totaled 1,007,000 long tons. From these figures, it may be deduced that the extra 257,000 long tons consumed were accounted for by the needs of other industries, as well as the increase of private company inventories of manganese during the year. Other users of high-grade manganese ores include producers of dry-cell batteries, chemicals, glass, enamel and various other items.

Similar calculations for 1938 and 1939 record steady declines in the "apparent consumption for non-steel uses" during both years. Normally, industrial statistics show declines for 1938 and advances in 1939. The statistical disparity in Table I probably is explained by the necessity for dipping into inventories in late 1939, as contrasted to the general increase in private stocks in 1937. However, it may be concluded that the mean of the 1937 and 1939 figures for "apparent consumption," or about 150,000 long tons, represent approximate normal requirements for other industries than steel.

In estimating 1941 needs of manganese ore, a 95 per cent average basis for steel activity was used. This would call for about 1,060,000 long tons of ore, while other industries may call for some 200,000 long tons, bringing total requirements to 1,260,000 long tons.

The vulnerability of the United States to any sudden stoppage of manganese imports has been recognized for several decades. Since the costly experience in World War I, metal and mining associations have repeatedly urged the Government to establish emergency stockpiles of this material. Yet, when World War II broke out in September, 1939, the administration had taken no effective action in this direction.

In 1917, a temporary shortage of high-grade manganese ores almost disrupted steel operations. The sudden unavailability of Russian supplies sent ferromanganese prices sky-rocketing to $400 a long ton in 1917, as against $92.21 in 1915. The average price of imported manganese ores doubled from $8.38 per ton in 1915 to $16.37 in 1917, and almost redoubled to $30.73 in 1918. The country paid heavliy for its unpreparedness. Luckily, Brazil's loss of its European markets forced that nation to send the bulk of its output here (see Table II). Moreover, high prices led to the exploitation of formerly uneconomic domestic ore, and a phenomenal output of 304,366 tons was achieved in 1918, as against 2635 tons in 1914 (see Table III).

This prosperous development of domestic ores at high prices led American manganese miners to apply pressure on Congress for a "protective" tariff after the war. Though domestic mines had never supplied over 38.2 per cent of the country's needs (1918), Congress in 1922 imposed a duty of 1 c. per lb. of manganese metal in imported ore. While the steel industry paid for this duty, domestic mines felt so "protected" that their peak output since then was the 76,000 tons for 1925, or about 12 per cent of the year's imports. Obviously, the purpose of the tariff was a failure.

Meanwhile, a study of the manganese situation by the American Institute of Mining and Metallurgical Engineers and the Mining and Metallurgical Society of America resulted in a recommendation to the Government in January, 1924, that the country *immediately*

purchase 600,000 tons of manganese ore as an emergency reserve, and, that there be no stimulating of the depletion of the small deposits of domestic ferro-grade ores during peacetime by means of a duty. In 1932, the manganese committee of the American Institute of Mining and Metallurgical Engineers was requested to reconsider this problem from the national defense standpoint, and recommended creation of a stockpile, since the duty had failed to encourage adequate domestic production. It was also suggested that research be conducted to develop processes for economically concentrating low-grade ores.

Manganese Situation?

—Here's how our requirements, our stockpile, our prices and our domestic production shape up. We are just likely to end up this war with a full-blown domestic production set-up, which would certainly be one point in the war's favor.

By B. W. CORRADO
Framingham, Massachusetts

To these warnings may be added the 1935 report of "The Mineral Reserves of the United States and Its Capacity for Production," prepared for the Planning Committee for Mineral Policy. This authoritative analysis revealed (among other things) that ferro-grade manganese ore reserves in the United States "are inadequate for supplying the needs" of the steel industry.

Finally, in 1938, Congress permitted the U. S. Navy to purchase small emergency supplies of manganese and other essential materials. This was enlarged upon by the passage of a "stockpile" bill in June, 1939, permitting Federal expenditure of $100,000,000 for the procurement of manganese and other essential materials during a four-year period. The legislation permitted a 25 per cent preferential price to American producers of these items.

Yet, more than a year later and ten months after the outbreak of war, the Procurement Division of the U. S. Treasury Department announced purchases totaling 86,500 tons of manganese ore up to July 1, 1940. This was equal to about one month's supply.

During July and August, 1940, the Federal-owned Metals Reserve Co. swiftly allotted sizable contracts and by Aug. 22, 1940, it was estimated that a total of 770,000 tons of manganese ore had been purchased by Federal agencies. This amount included 240,000 tons for delivery during the next three years by Anaconda Copper, and some 195,000 tons from Cuban-American Manganese Corp., also for delivery during 1941, 1942, and 1943. Thus, about 50 per cent of total Government purchases are for long-term delivery, although about 570,000 long tons of this will be available by the 1941 year-end.

Of greater consolation are the 878,000 long tons in bonded warehouses at the end of November, 1940. This nine months' supply, earmarked largely for American consumers, is maintained in bond until actually required thereby deferring the payment of the duty as long as possible. Besides this bonded store, steel producers probably maintain at their plants from 60 to 90-days' supply, so that private inventories at plants and in bonded warehouses currently exceed one year's requirements. Actual Federal holdings would give an additional six months' reserve, while the continued availability of supplies from Brazil and Cuba may be safely assumed for many months ahead. At the same time, the small domestic output is being increased.

The 85 per cent increase in prices of foreign ores since the outbreak of War has had little stimulative effect upon the actual domestic output of ferro-grade ores. Production for 1940 may have approximated 40,000 long tons, as against 29,307 in 1939. The former figure represents less than 4 per cent of total 1940 needs.

On the other hand, reported discoveries of manganese deposits have increased with amazing rapidity. The reason is quite obvious: the R.F.C. is authorized to make loans up to $40,000 each for the development of deposits of strategic metals, and has $10,000,000 for this purpose. Also, surprising has been the number of new processes of concentrating low-grade manganese ores publicly announced during recent months. From a national defense viewpoint, it would seem more advisable to safeguard the country's limited deposits of this precious mineral, than to pay premiums to encourage the early depletion of economically recoverable deposits, especially while foreign supplies remain available.

A few years ago, it was reliably estimated that deposits could yield about 600,000 long tons of ferro-grade ores at market prices around 71c. a unit (present levels). Allowing for the 25 per cent premium to domestic miners, supplies at 88c. per unit would total 1,000,000 long tons, or about 10 months' requirements. Moreover, it was calculated that the country's entire deposits

TABLE I

Manganese Requirement Schedule

(Long Tons)

	1937	1938	1939	1940 (Estimated)	1941 (Projected)
Steel output (000's omitted)	56,637x	31,752x	52,779x	65,000x	80,000x
Approximate steel needs of:					
Metallic manganese, or	316,000	174,000	294,600	362,720	446,428
Ferromanganese, or	395,000	217,000	368,450	453,350	558,035
Manganese ore (48 Mn)	750,000	412,300	700,055	861,365	1,060,266
Actual consumption of ferro-grade manganese ores for all uses Note Y)	1,007,709	559,822	734,769	1,011,365	1,260,266
Apparent consumption for non-steel use	257,709	147,522	34,714	150,000	200,000
ACTUAL					
Ferromanganese output	376,443	242,994	270,111	420,000	560,000
Ferromanganese imported	29,559	26,258	41,227	11,000	
Approximate amount of manganese ore involved in total ferromanganese available	763,496	489,176	591,542	818,900	1,064,000

NOTE: This schedule is calculated on the basis of 14 lb. of metallic manganese required per long ton of steel, or 12½ lb. per short ton; ferromanganese averaging 80 per cent Mn; and 1.9 tons of ferro-grade ore required to produce one ton of ferromanganese.
Spiegeleisen not included in calculations, since total consumption includes a relatively small amount of metallic manganese in relation to the manganese content of the ferromanganese consumed.
X—Short tons. Y—U. S. Bureau of Mines indicated Consumption figures plus the approximate amount of manganese ore required abroad to produce the ferromanganese imported.
Sources of 1937-39 statistics: American Iron and Steel Institute, U. S. Bureau of Mines, Bureau of Foreign and Domestic Commerce, and Metal Statistics for 1940.

would yield 1,700,000 long tons with prices at $1 a unit (not witnessed since 1918).

A substantial portion of recoverable deposits in the United States should be derived from the Butte, Montana, mines leased by Anaconda Copper, which is constructing a $1,000,000 plant to concentrate and nodulize its medium-grade ores into 58 per cent Mn concentrates. Annual capacity will approximate 100,000 long tons, and delivery should start in early 1941.

In addition, the Government has relased $1,375,000 for a beneficiation program by the metallurgical division of the Bureau of Mines. About $400,000 of this sum will go toward building a pilot plant for experiments in electrolytic beneficiation of manganese ores. If this or some other method proves practical in making usable for steelmaking the country's abundant low-grade deposits (averaging 5 to 10 per cent Mn), then output would be increased substantially.

Unless surprising developments occur, the domestic output of ferro-grade manganese ore in 1941 should not exceed 150,000 tons, or 12 per cent of probable total requirements for the year.

The small domestic output is supplemented by supplies from Cuba, 90 miles off the coast, where the Cuban-American Manganese Corp. has spent over $3,000,000 to develop a flotation method of concentrating medium-grade Cuban ores. Despite this development, the company had to shut its plants in early 1935, when the U. S.-Brazilian Trade Agreement was announced cutting the manganese duty by 50 per cent. Since imports from Cuba are duty-free, the tariff-cut lowered Cuba's protection, and required Cuban-American to cut its costs further in order to operate profitably. This was accomplished early in 1937 by installing a $500,000 wet-processing sintering kiln.

As a result, Cuba's output rose to 129,000 long tons in 1937, was moderately lower in 1938, and declined even further to 100,800 long tons in 1939. The 1939 output consisted of 95,231 tons of nodulized concentrates (produced by the new process) and 5545 tons derived by the old process of washing, jigging, and sorting.

The Metals Reserve Corp. has contracted to receive from this sole major producer in Cuba between 25,000 and 65,000 long tons of ferro-grade ores annually during the next three years. Cuban-American's plant capacity is being raised from 100,000 tons annually to 130,000 tons of high-grade ores (over 50 per cent Mn). In addition, the company can turn out about 50,000 tons of 39 to 40 per cent Mn ores. Thus, the United States may expect 180,000 long tons from Cuba in 1941.

The largest manganese ore producer in this hemisphere is Brazil, whose deposits are probably the most extensive in the world. In 1917, Brazil produced 524,000 long tons of ferro-grade ores, although Russian competition in later years substantially reduced the Brazilian output. Brazil's average annual

TABLE II

Imports of Ferro-Grade Manganese Ores For Selected Periods

(Long Tons)

Period	Russia	Gold Coast	India	Brazil	Cuba	South Africa	*Total Imports	Average Value Per Long Ton
1914	52,681	0	103,583	113,924	0	0	283,294	$7.14
1917	0	0	48,975	512,517	44,511	0	629,972	16.27
1918	0	0	29,275	345,877	82,974	0	491,303	30.73
1929	329,336	33,593	72,940	216,535	2,667	0	664,299	12.23
1932	55,437	24,592	1,750	21,500	6,749	0	110,634	10.15
1936	289,867	241,593	126,913	110,018	37,876	0	813,362A	10.71
1937	383,949	254,547	70,380	77,988	122,937	0	911,919A	11.46
1938	166,043	126,858	25,480	29,698	131,423	0	483,588A	14.31
1939	135,243	242,923	89,544	42,713	105,935	0	627,129A	13.55
1940 (Jan.-Nov.)	304,016	210,256	143,490	156,182	120,067	165,118	1,145,224A	
1940 GENERAL IMPORTS								
Jan.	24,700	27,900	15,000	26,800	5,327	4,265	108,257	
Feb.	20,036	13,661	8,197	8,197	12,751	25,501	91,075	
Mar.	33,500	27,918	25,684	2,232	13,399	4,467	111,666	
Apr.	18,765	17,827	12,198	13,136	4,691	23,456	93,823	
May	40,580	22,575	1,995	8,800	15,912	14,595	112,915	
June	8,650	0	6,918	13,086	8,873	21,381	62,908	
July	22,285	0	8,550	25,225	16,045	21,942	98,341	
Aug.	6,200	27,069	11,900	18,531	8,003	33,842	121,054	
Sept.	0	27,964	13,560	29,221	5,686	48,249	127,830	
Oct.	570	14,647	13,141	35,305	5,668	345	73,045	
Nov.	0	19,222	41,461	10,025	23,141	19,203	119,184	
Jan.-Nov.	175,286	198,783	158,604	190,559	119,496	217,246	1,120,098	

A—Indicates imports for consumption; other figures represent general imports.
* Includes others. E—Estimated.
Sources—U. S. Bureau of Mines, Bureau of Foreign and Domestic Commerce, and the American Metal Market.

output during the 1937-39 period approximated 219,000 long tons, but actual exports averaged 188,000 long tons annually. Of the exports for 1937, 1938 and 1939, Brazil sent us 60.2, 32.8 and 51.4 per cent, respectively, during those years. The balance was sent chiefly to Holland, Belgium, Luxemburg, Germany and France. With these nations blockaded, the only major market left for Brazilian ores is the United States. Thus, actual imports from Brazil during the first 11 months of 1940, 191,000 tons, exceeded annual imports from that source for the previous 10 years.

The major obstacle to large expansion in Brazil's output is the railway which hauls the ores from the mines to the seacoast. The road is reported inadequate for transporting the nation's capacity output of manganese, and requires rehabilitation. Since United States-Brazil relations have been cordial, this country may find it expedient to finance improvement of the railroad in order to permit a larger output of manganese, perhaps over 400,000 tons annually. Otherwise, it is doubtful if Brazil's 1941 output will exceed 300,000 long tons.

A U. S. Steel Corp. subsidiary owns Brazil's largest manganese mine, but some of the other mines are controlled, entirely or in part, by European capital. Of course, the Brazilian government could insure capacity operation of the latter group of mines, if this were a provision of a contract with the United States, assuring this country of definite amounts of manganese at certain prices during the next few years.

Lesser relief to the situation may be forthcoming from Chile, which exported an average of 15,000 long tons annually from 1937-39. However, its deposits of over 1,000,000 tons of 30 to 40 per cent Mn ores could be concentrated into metallurgical ore by use of American processing methods. Unless such large-scale exploitation is witnessed, the United States may not expect much more than 20,000 long tons annually from this source.

In recapitulation, the indicated U. S. output of 150,000 long tons in 1941, should be supplemented by 180,000 from Cuba, perhaps 300,000 from Brazil, and 20,000 from Chile. This total of 650,000 long tons would meet about 50 per cent of 1941 needs. If the country should be cut off from eastern hemisphere sources in 1941, the annual output available in this hemisphere and the 1½ years' reserve supply would secure the United States against a shortage until the end of 1943.

It is comforting to note that these estimates are based upon productivity at present prices, indicating that higher prices are not necessary to secure this position. If the situation is well managed and kept free of domestic political pressure, the price advances and embarrassment of 1917 will not be repeated. Dubious subsidies are certainly unnecessary as long as shipments continue to arrive from Africa, India, and Brazil.

is unlikely that prices will rise much further, unless Federal bidding for stockpile supplies of ore, in competition with actual consumers, forces ore prices higher and, in turn, ferromanganese quotations.

Ferro Supplies Ample

Besides large amounts of manganese ore, this country has imported 20,000 to 40,000 long tons of ferromanganese annually in recent years. The ferromanganese imports have averaged only 10 per cent of domestic output, and have come chiefly from Norway with smaller quantities from the United Kingdom, Canada, and

TABLE III

Domestic Manganese Ore Output, Imports and Stocks

(Ferro-Grade Ore Only)

Year	Imports	Domestic Output	Per Cent of Available Supplies from Domestic Sources	Year End Stocks
1917	629,972	129,405	17.0	N.A.
1918	491,303	304,366	38.2	N.A.
1929	664,269	47,597	6.4	N.A.
1932	110,634	9,963	9.0	622,489
1936	813,362A	18,557	2.2	366,381
1937	911,919A	26,419	2.8	681,290
1938	483,588A	16,989	3.4	842,048
1939	627,129A	29,307	4.4	903,561
1940 (Jan.-Nov.)	1,145,224A	36,700	3.1	878,435

NOTE: All amounts are in long tons of 2240 lb.
N.A.—Not Available. A—Imports for consumption, previous figures represent general imports, i.e., the actual arrivals at American ports.
Sources: U. S. Bureau of Mines, Bureau of Foreign and Domestic Commerce, and the American Metal Market.

Manganese ore is quoted on a long-ton-unit basis. This unit represents 1 per cent of a long ton of metallic manganese, or 22.4 pounds. Thus, a price of 71c. f.o.b. Baltimore for Cuban ore averaging 51 per cent manganese would mean \$71 x 51 per cent or \$36.21 a long ton, free of duty. Other ores would be subject to a duty of ½c. a lb. of contained manganese, so that a ton of 51 per cent ore would contain 1142 lb. of metallic manganese and be subject to an import tariff of \$5.71. Foreign ores are quoted at nominal prices approximating Cuban ore quotations plus the duty. Published prices are generally higher than those actually paid, since large purchasers usually buy on term contracts.

The advance in price since the outbreak of war is illustrated by the rise in the unit price of Brazilian 48 per cent ores from 27c. on Aug. 30, 1939, to 50c. in early January, 1941. Ferromanganese prices have advanced from \$80 a long ton before the war to \$120. It

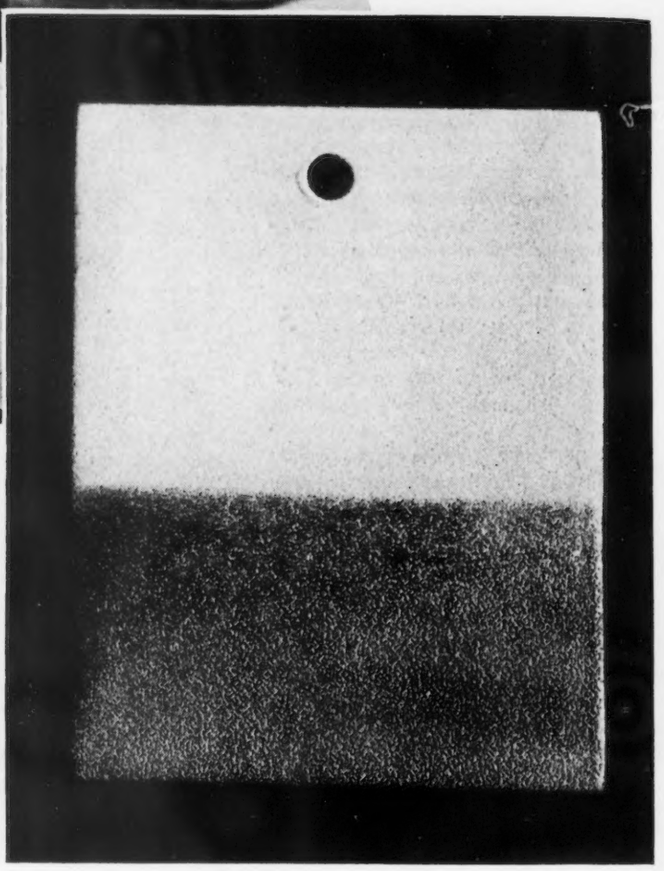
European countries now blockaded. Obviously, the United States cannot depend upon these nations for ferroalloys for some time to come.

Table I indicates that the domestic steel industry will require 558,000 long tons of ferromanganese in 1941, as against our record output of 376,000 long tons in 1937. However, the March, 1940, rate of productivity, 41,280 long tons, indicates that in an emergency this country could turn out 495,000 long tons annually. Moreover, should the need arise, one or two additional furnaces could be brought into ferromanganese production. Meanwhile, the small experimental output of electrolytic manganese, and present inventories of steel producers also should ease any threatened bottleneck. Thus, the ferromanganese situation appears satisfactory for 1941.

Ed. Note:—Next week THE IRON AGE *will present by another author, detailed data on a promising process for the recovery of manganese from low-grade domestic ores.*

Metal

ABOVE
STEEL shells of floating mines sprayed with zinc to prevent corrosion by salt water.



RIGHT
ACTUAL size of zinc sprayed sample. The slightly rough surface is excellent as a base for paint. Lower part brightened by light wire brushing.

SIMPLICITY of equipment and ease of operation feature the recently perfected process of spraying powdered metals, notably zinc, on other metals to protect them against the ravages of corrosion by salt water, fumes and chemicals. Unlike ordinary metal spraying, the Schori Process Corp.'s method uses metal in powder, rather than in wire form, which offers a great saving in raw material costs and eliminates the necessity of a delicate wire feeding mechanism which may wear out or require adjustment. Furthermore, a metallic zinc powder of extremely uniform and fine particle size is now commercially available. This provides a spray with a high percentage of efficiency, low gas consumption and greater ease of application. Such factors have combined greatly to broaden the field of useful application for this process, and to pave the way for its extended use in many lines of industry in the future.

[For other articles on metal spraying, see THE IRON AGE, April 3, 1939, p. 47; Nov. 11, 1937, p. 100; Aug. 5, 1937, p. 36; March 12, 1936, p. 61; April 9, 1937, p. 49; etc.]

While it is not intended or even hoped that the process will replace ordinary hot galvanizing, particularly on thin flat sheets, nevertheless, the Schori method is said to offer a number of distinct advantages which cannot be overlooked. Chief among these is the extreme portability of the required equipment. It is a relatively simple task to transport the gun, gas and oxygen tanks, the zinc powder and the blasting equipment to the point where the work is to be done. This is of great importance if parts of bridges or other large fixed objects are to be sprayed.

As the work being done remains comparatively cool, there is no danger of a change in physical properties such as sometimes occurs during the hot galvanizing operation. Large or complex shapes can therefore be zinc coated without any necessity of fairing out or straightening. Similarly malleable iron and heat treated alloys may be safely sprayed with no loss in strength or other physical properties. Metals to be protected by zinc, which must re-

Spraying

—The Schori powdered zinc gun is finding widespread application, both for commercial applications where protection against corrosion is desired, and for various types of war materials

tain their original hardness and spring, are also best treated in this manner.

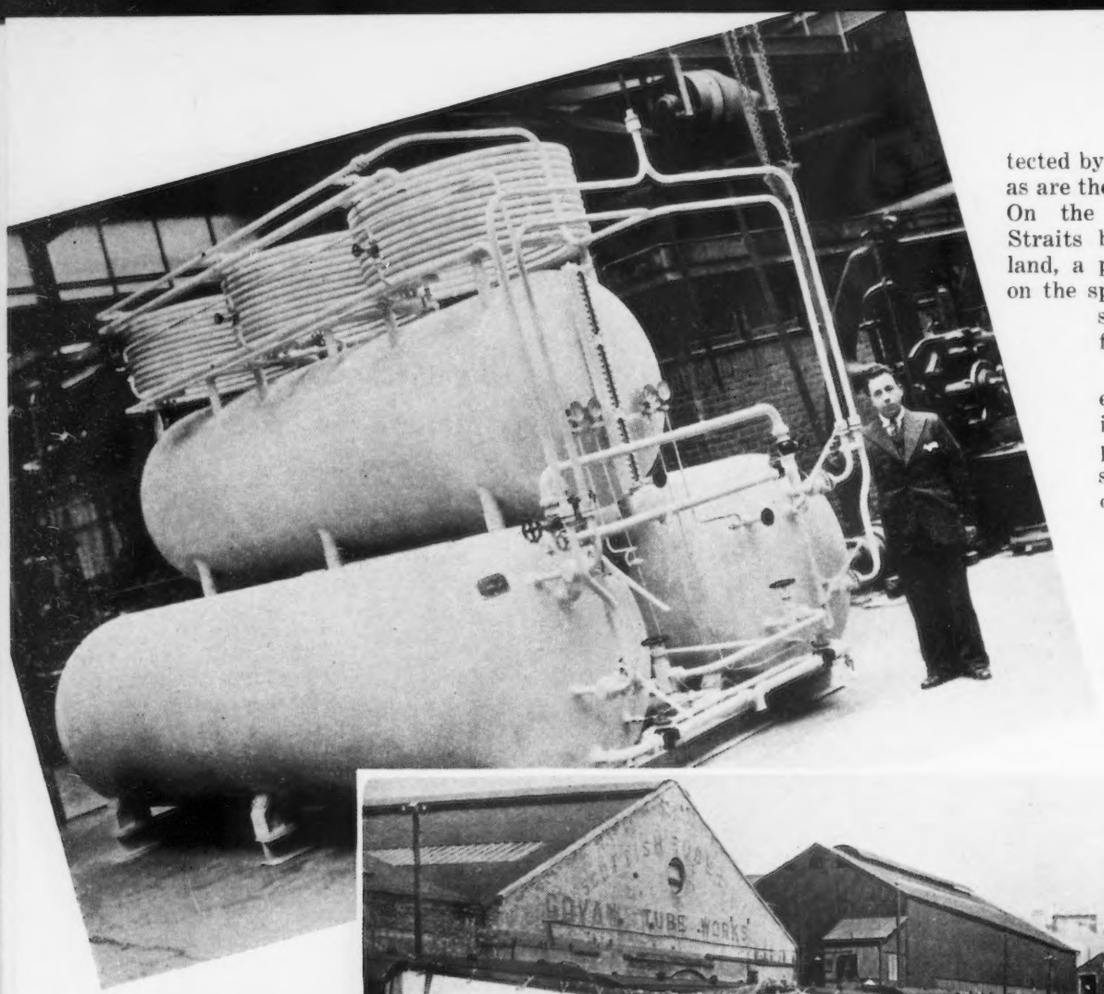
Not to be overlooked is the fact that any desired amount of zinc can be sprayed on whereas, in hot galvanizing, the thickness of coating is governed by the amount of zinc which will adhere to the surface after dipping. In certain applications where exceptionally long life for the protective coating is required, or where the application is subjected to extremely corrosive conditions, an especially heavy covering can be applied by spraying successive coats. A single operator can build up the desired thickness of coating without idle time between coats, as cooling is extremely rapid and each coat deposits approximately 0.003 in. of zinc, equivalent to approximately 1½ oz. per sq. ft. The film is very dense, having a specific gravity of 96 to 97 per cent that of wrought zinc.

Originating in Belgium in 1933, where it has found many uses, the Schori process has also become standard in a number of other European countries, and use of the process is now spreading in this country. Reference to the accompanying illustrations will give a good idea of the present diversification of its uses, but in general it may be said that the Schori process can be advantageously used wherever galvanizing is impractical, as well as in all cases where very heavy welded or riveted objects are to be protected by zinc.

For example, an English manufacturer now sprays his line of pit tubs for use in mine work, covering the tub body with a dense, tough, impervious coating of zinc. In spite of the extremely corrosive action of the acid mine waters, these tubs are now expected to have a useful life of eight years, or just double that of the older, untreated tubs.

The large cast links of chain bridges are being successfully pro-

LINKS of chain bridge zinc sprayed before erection.

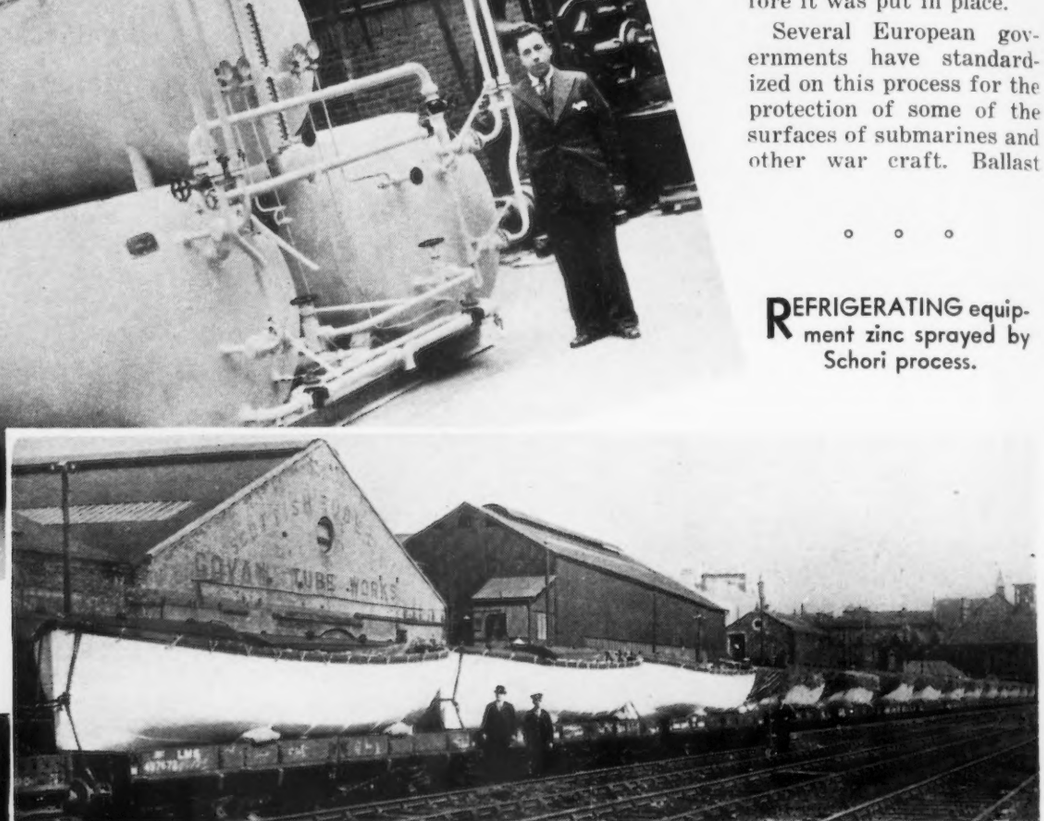


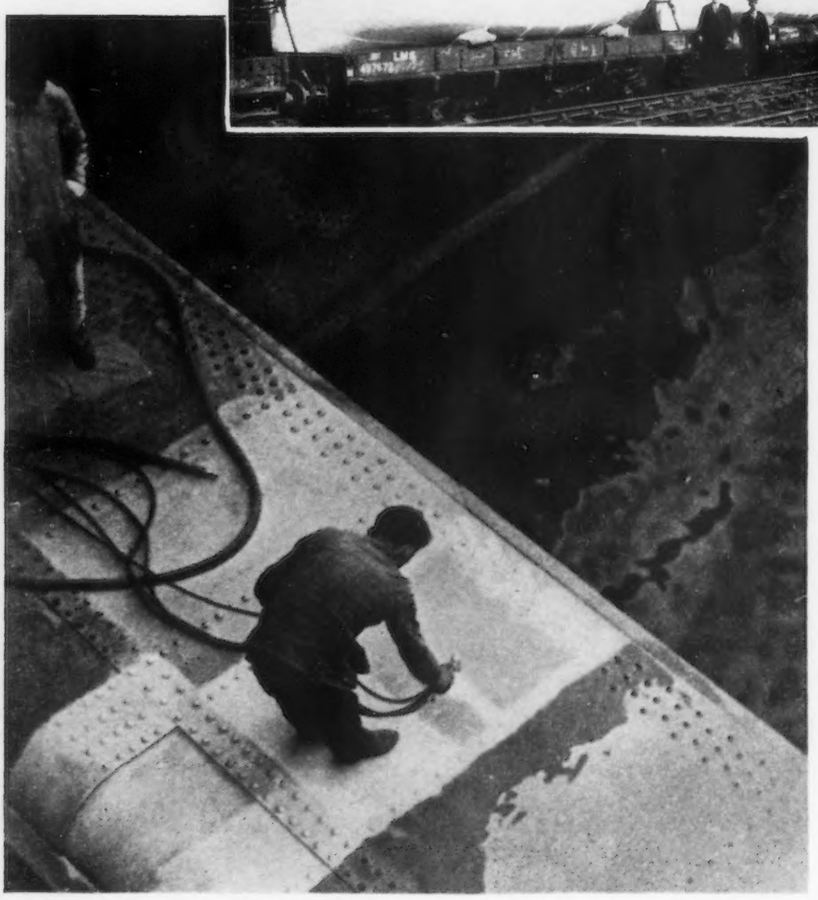
tected by zinc spraying in England, as are the sluice gates of tidal locks. On the erection of the Menai Straits bridge near London England, a portable plant was set up on the spot which blasted and zinc sprayed each link just before it was put in place.

Several European governments have standardized on this process for the protection of some of the surfaces of submarines and other war craft. Ballast

o o o

REFRIGERATING equipment zinc sprayed by Schori process.





ABOVE

LIFEBOAT hulls protected by Schori process against salt water corrosion. Finished with white paint.

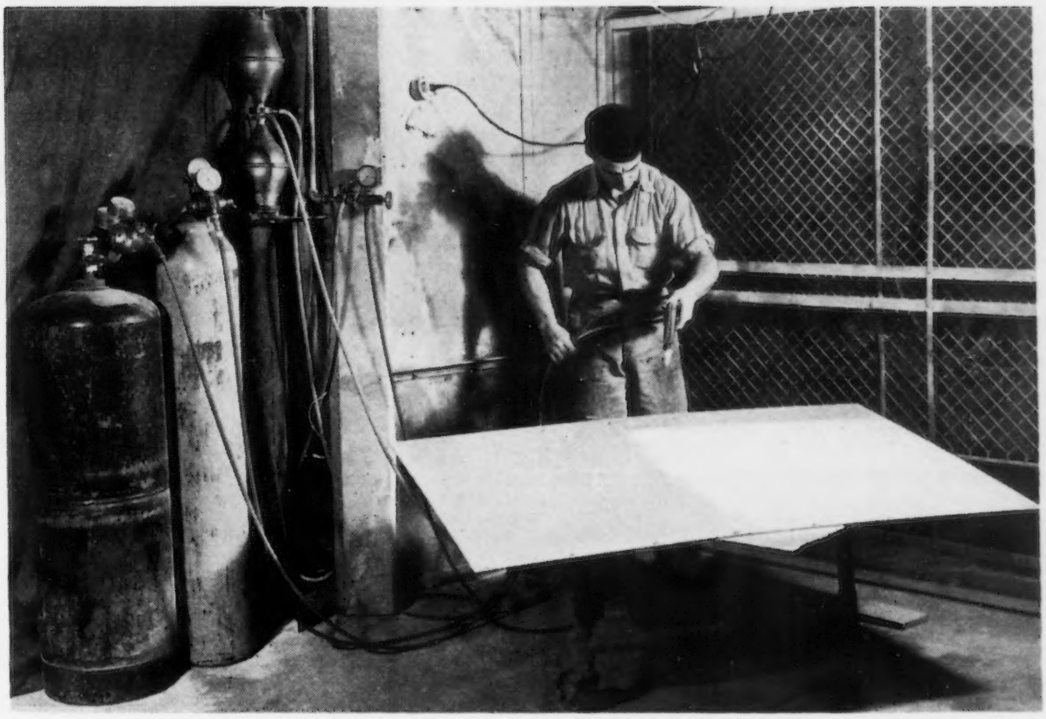
o o o

LEFT

APPLYING powdered zinc to a sluice gate in England.

o o o

tanks of ships, in particular, are difficult to protect against corrosion and are now sprayed, as are various valves, deck fittings, ventilating equipment, steel lifeboats and other accessories of sea going ships. The British Admiralty specifies the zinc spraying of deck plating for destroyers, inner bottoms of cruisers, and the interior of gasoline storage tanks. Schori pistols are also employed abroad to zinc-spray ammunition, submarine



SPRAYING zinc by the Schori process on 1/4-in. steel sheet for protection. Note simplicity of equipment and ease of handling.

mines and the projectiles for large guns. In the latter case it is reported that, in addition to preventing rust, the coating acts as a lubricant and reduces the wear on the rifling of the gun, which is essential to insure accuracy of flight of the shells.

In this country, the Bureau of Marine Inspection and Navigation of the Department of Commerce has investigated and approved the use of the Schori zinc spraying process as a substitute for hot dip galvanizing, which is now required by the rules and regulations on ships under its jurisdiction. Life boat parts in particular are now being sprayed and the use should grow, due to the protection afforded as well as the ease with which finishing paint of any color can be applied. This is because of the slightly rough, matte surface of the zinc which provides an excellent base for paint.

In industry, the possible applications for the process are almost unlimited. Tanks and drums, many types of machinery, electrical switchboxes, street lamps, insulators, window frames and structural girders all lend themselves to effective protection. Heating and air conditioning equipment, as well as general sheet metal work susceptible to rust or corrosion, can be given practically indefinite useful life by initial, or, if necessary, repeated applications of sprayed zinc.

It is reported that the new lock gates of the Panama Canal are to be zinc sprayed for protection by the Schori process. Severe rusting of steel girders on bridges is caused by the drip of brine from refrigerator railroad cars. This could be successfully combated by zinc spraying. Likewise, large gas hold-

GRIT blasting prior to zinc spraying.

ers, especially those of the type which are raised and lowered, offer rusting problems which could be overcome by this process.

Coal and ore carrying railroad cars, exposed to the elements and subjected to much abrasion, offer a serious rust problem, best controlled by zinc spraying. This, of course, provides a thicker and more abrasion resistant coat than can be formed by painting alone.

Another interesting application that is proving to be of great value concerns articles made up of galvanized sheets and plates assembled by welding. Normal practice for this operation is to strike an arc and burn off the zinc coating in places where welding is to be done. This results in offensive and toxic vapors which must be removed by portable ventilating equipment and also usually requires the use of a fume mask by the operator. It also has the effect of leaving unprotected against corrosion the places where action is most severe, i.e., along the welds. Using the zinc spraying process, however, the fabricated article could be constructed of black iron which can be welded much more rapidly than can galvanized parts. After welding, the completed article could be thoroughly blast cleaned and sprayed. Full protection is thus given to the welds as well as to the main body of the object.

Another large manufacturer of galvanized castings has installed the equipment to touch up defective surfaces caused by flux spots. Defective castings are blasted around the defect and then sprayed and buffed. This is saving hundreds of dollars by eliminating rejects.

The necessary equipment is composed essentially of the spray gun, zinc powder chamber, acetylene or propane and oxygen tanks and a compressed air source, all connected by flexible rubber hoses. In operation, the gas is ignited and forced at an adjustable rate through the gun nozzle. Compressed air flowing through an injector nozzle sets up a partial vacuum of about 15 in. of mercury in the tube leading to the zinc powder container. This vacuum draws into the gun powder suspended in an air stream. This procedure eliminates the danger of clogging of the powder. The vacuum, however, is controlled by the operator and may be by-passed when he removes his thumb from a small hole in the handle of the gun. This allows the pressure of the compressed air to draw outside air into the gun, shutting off the supply of powder. Thus, there is no waste of zinc until the operator is completely ready to spray. The savings effected by not having metal fed into the flame while the operator is moving about or arranging the work are not to be underestimated.

The value of a zinc powder with an extremely uniform particle size is brought out when the zinc meets the flame, as all particles are heated evenly with no danger of small particles being overheated to the point of oxidation or large particles not melting. This affords a smooth, evenly deposited zinc coating. Thus, it is seen that no feeding mechanism is needed. There are no moving parts in the Schori pistol to wear out or need adjustment.

In operation, the gun is held about 10 in. from the work and is moved slowly back and forth much as a paint sprayer is used. An angle of approximately 90 deg. is always maintained between the spray and the work, as any major variance from this angle may cause ricocheting or otherwise interfere with proper adherence. Edges are sprayed first, followed by flat surfaces.

As with practically all finishing, the preparation of the surface to be sprayed is of much importance. Improper or insufficient cleaning can prevent the proper bond between the zinc coating and the base metal, materially affecting the useful life of the coating. Sand or grit blasting are the most satisfactory methods and offer excellent means of removing mill scale, rust and old paint. In general, angular steel grit blasting is used in the shop where recovery of the abrasive is possible, and sand blasting when the work is done outside the shop.

The applied zinc finish has a pleasing light gray appearance with a texture somewhat similar to fine sandpaper. For certain applications the coating can be brightened by wire brushing or even buffed to a high, smooth luster. In its natural form, however, the coating makes an excellent base for paint, having the necessary degree of roughness to insure proper adherence of the paint film.

Although zinc powder is largely used because of the protection it affords, the Schori process is equally well suited to spray a great variety of other metals and materials, as well as certain combinations of both. Aluminum, copper, lead, tin, bronze and cadmium have been used where their particular properties have indicated their special suitability. As all these and other metals are available in powder form, they may be sprayed with this gun. Similarly, special combinations can be sprayed, as well as certain plastics, rubber and synthetic rubber, the latter providing exceptionally good protection against the action of certain chemicals.

The economic advantages of the process—low raw material cost and no waste, small quantities of fuel and high speed of application—have focused attention on the possibilities of the process. Furthermore, its increasing acceptance by engineers in general should result in a greatly extended use of the process by industry.

TWENTY-SIXTH in a Series of Articles on the Technical and Economic Aspects of Metal Cleaning and Finishing

Wedge-Wire Screen Now Made in U. S.

NON-CLOGGING sieves, screens and grids for the mining, chemical and other industries are being produced in this country with special imported equipment by Wedge Wire Corp., Cleveland, which makes wedge-shaped wire out of stainless steel, brass, phosphor bronze, Monel metal, aluminum, copper and other metals.

Such screens have been used for many years and have proved superior for certain processes because they will effectively dewater more material on a given working surface. This may be accounted for in the uninterrupted working surface and drainage slots.

Formerly the product was obtainable only from England or Germany, but the Cleveland company has imported from England two machines which loop, index and press the wire in dies, the entire operation being continuous.

Quite elaborate fabricating and pressing machines are necessary to assure the accurate finished product. The machines twist the round wire, running from coils, at the properly indexed intervals and feed the looped segments into the pressing dies on a stop-press-start cycle. The production is thus continuous, the desired lengths being automatically cut off.

With the wire pressed into triangular shape, the base of the triagle is inverted and when joined with other pieces of wire similarly pressed and arranged, the bases become the working surface of the sieve or grid. After passing through the opening, the material being drained or filtered is provided quick relief because of the downward enlarging apertures formed by the triangles, and clogging is thus avoided.

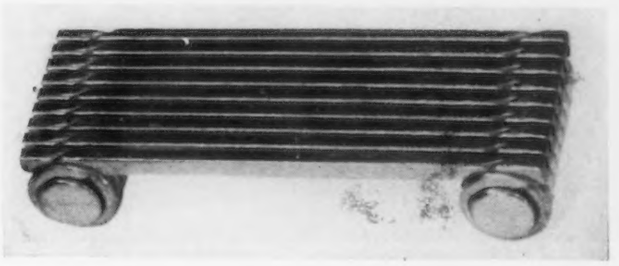
The loop-bar triangular strands of wire are securely fixed in grid form by cross rods which are placed through the loops and which are riveted or bolted in place.

The grids are widely used in the coal industry and for such use stainless, brass or carbon steel is generally employed.

For certain chemicals which are dewatered by continuous centrifugal action at high speed, cylindrical grids of the wedge wire are provided. The shape of the grid is not limited necessarily, but demand is principally for flat mats and cylindrical shapes.

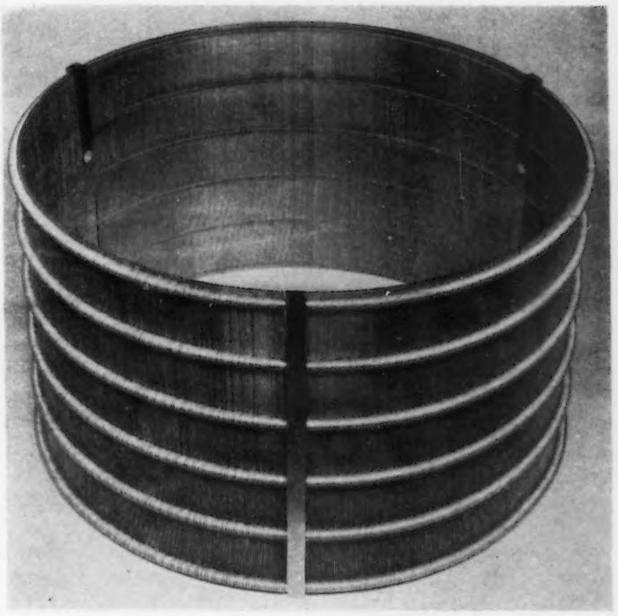
Where high abrasive action is encountered and where a smooth working surface is not essential, the profile of the wire can be made in various shapes to allow for great wear before the size of the orifice changes due to the abrasive action.

Standard apertures are ¼ mm. (0.010 in.); ½ mm.; ¾ mm. and 1 mm. There are eight bars to the inch for ¼-mm. mesh, seven bars to the inch for 1-mm. mesh, and between seven and eight bars to the inch for ½ and ¾-mm. mesh. Cross retaining rods are spaced 2¾ in. center-to-center. Center of cross rods is approximately ⅜-in. below the working surface of the screen. Standard cross rods are 5/16 in. in diameter.



TOP view of wedge wire screen showing method of joining wires with loop bar strands.

o o o



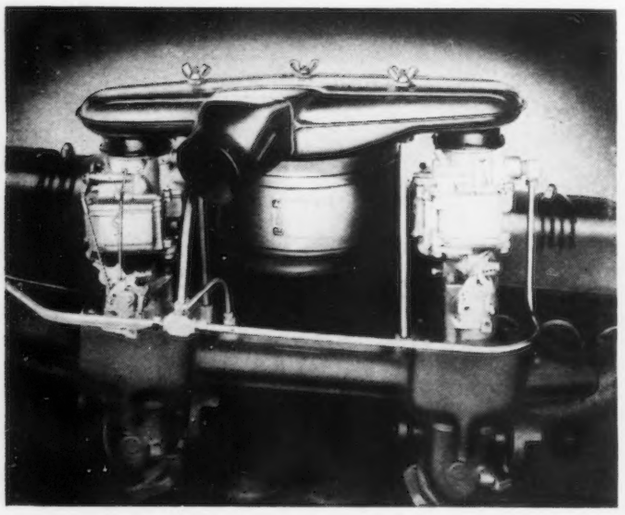
CYLINDRICAL construction of wedge wire sieves, such as shown here, facilitates speedy dewatering.

'41 Cars Have Many Die

IF reliance is placed on casual inspection only, it is easy to reach the mistaken impression that the die castings used in modern automobiles serve chiefly a decorative function. Nobody can truthfully deny that die castings do play an important part in smart styling features. But, it requires hardly more than a second look to discover that nearly every one of those neatly styled die castings performs also some important structural function.

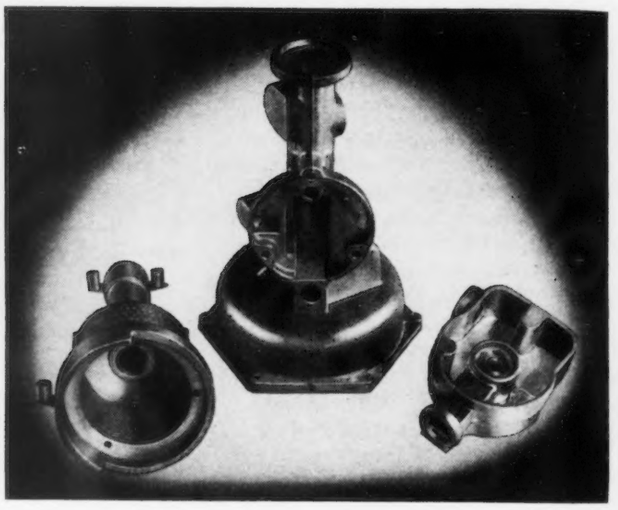
Scores of hardware parts, for example, are primarily functional, as are also steering wheel elements, instrument frames, glove doors, headlamp bezels, tail lamp housings, hood latches, license plate supports, direction signal parts and many others. For these, the die casting is used, of course, not only because it lends itself to production in attractive forms which are smooth, easily plated and not subject to red rust, but because the zinc alloys used are strong and tough, can be cast rapidly and accurately in thin sections and so make excellent structures for such uses as are outlined here.

It is only when the observer looks below the surface at parts which the car user seldom, if ever, sees, and which thus require no styling, that he discovers how many parts properly classified as "mechanical" are also die cast. In such applications, the die casting is primarily structural and functional. And the zinc alloys are usually chosen both because of their strength and toughness, and because they lend themselves to economical production in shapes which cannot be produced with equal economy by any other means. Invariably there are important savings in machine work, and often almost no machining is required or only some very simple operation such as drilling, tapping or reaming. This, of course, saves greatly in tooling expense, and its effect is to release machines for other work and to free skilled labor for the production of other types of parts which must, of necessity, undergo precise machining operations.



BOTH carburetors used on 1941 Buick cars are die cast, as are also the carburetors and many associated parts on most automotive vehicles.

THESE zinc alloy die castings are among those used in the 1941 Chrysler gear shifting mechanism and associated governor parts for automatic gear changing.



It is doubtful whether many engineers and designers who are not directly concerned with die cast parts for nearly all types of automotive equipment realize how many such strictly mechanical or structural parts there are in modern vehicles. Many of these are found in trucks, and some in other automotive equipment. They are even gaining increasing application in aircraft, although for these applications, the light alloys must be used.

Today, the die casting has almost completely displaced other types of castings in carburetors and for several associated parts, such as fuel pumps and adapters for supporting

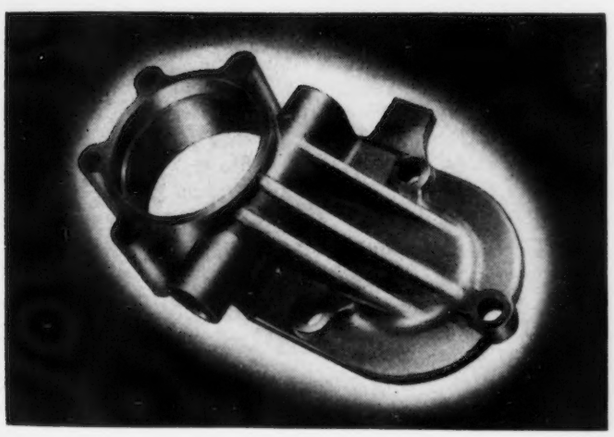
Cast Mechanical Parts

them, fuel strainer supports, throttle bodies and a variety of fittings. Cast iron for such parts would be subject to red rust and would require a great deal of expense for machining recesses and passages, most of which, in the die casting, are cored to size. Brass sand castings could be substituted but they, too, would require much more machine work than the die casting. In both cases, the sand casting would weigh more and cost much more than the die casting, which is a "natural" for such uses.

Much the same might be said for many parts required in units for operation by vacuum and connected to the inlet manifold. Several basic parts of windshield wipers, for example, are die cast (and the same is true when the units are electrically operated). Vacuum operated gear shifting devices also incorporate several die castings. The same is true of vacuum brake systems, now used chiefly in trucks. Then there are several die castings in the new vacuum operated window regulators and several are employed in vacuum operated tops for convertible cars. Even when hydraulic or electrically operated parts are substituted for those which are vacuum operated, die castings prove their utility for similar elements. Some of the units mentioned require governor elements which are die cast and when, as on some trucks, a governor is applied to the engine, several parts of it are also die cast.

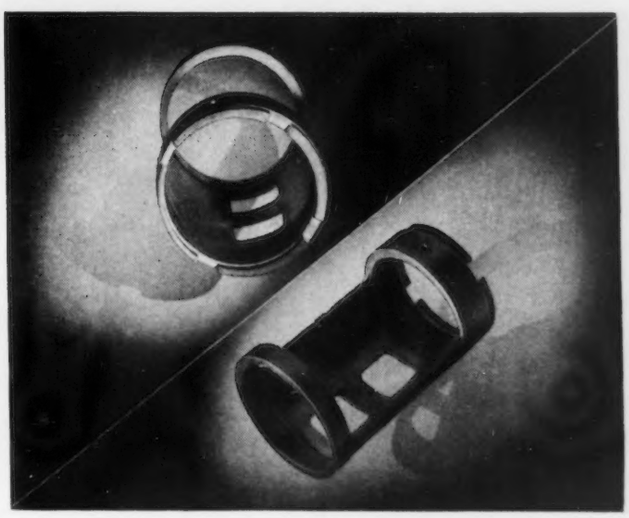
Parts for speedometers and for other instruments are among those die cast, and have been for many years, because the die casting is as useful in light mechanisms and housings as in those which are heavier. Among other parts still classified as accessories, but often furnished as standard equipment, may be mentioned such items as shock absorber parts, seat adjusting parts, elements for operating direction signals and portions of heating and ventilating systems. The latter include fan and blower housings, heater housings, defroster housings and fittings and several other parts.

It should not be thought, however, that the die casting is suited only for accessory classifications, for it enters also into the structure of several major parts of the chassis itself. Thus, steering wheel hubs, horn rings, steering column adjustment sleeves, steering column brackets and several parts for hand as well as for power shifters, which are die cast in zinc alloy, enter in steering column assemblies. One prominent car maker has now used a die cast gearset (transmission) cover successfully for three years, and another employs a 3-lb. die casting for a gearset part on light trucks. Both of these are in addition to shifter parts already mentioned. At least two prominent



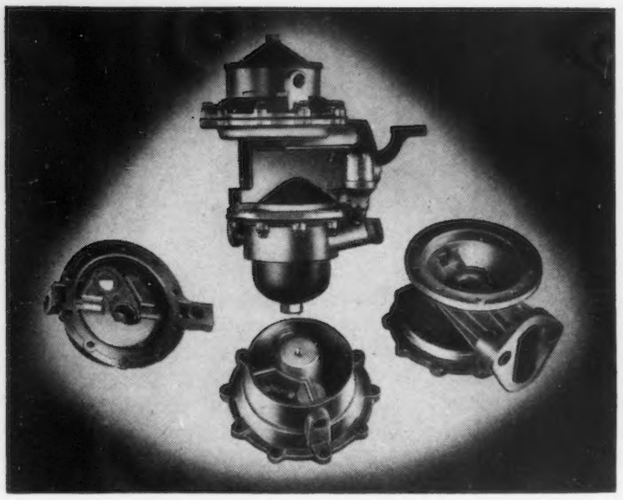
BELOW

ALL General Motors cars are reported to be equipped with steering gear units in which this die cast column adjustment sleeve is a part. Much more machine work would be required if it were to be made in any but die cast form.



ABOVE

MANY thousands of these zinc alloy die castings are required annually for use in connection with Chevrolet truck transmissions.



NEARLY all American cars, and some other automotive vehicles, make use of fuel pump and filter die castings similar to those for the Buick cars, as shown above.

DIMMER switch housings are now being supplied for use in several 1941 cars and trucks.

car makers are using oil seal parts on engine crankshafts and a well-known maker of oil seals suitable for the same and for similar uses in engines, axles and other units has recently adopted die cast holders for the flexible portion of seal rings. Engine oil pump and oil filter parts are also being die cast.

Among electrical parts which the user rarely sees is the housing for dimmer switches commonly placed below the toe boards. Seal rings for headlamps are die cast in sections only, 0.015 in. thick, and so ductile that they are spun in place. Interior courtesy light parts are being die cast because the shapes required are economically made in this way, much as for tail light and for license lights.

When it comes to unseen body parts, it is only necessary to remove interior door trim panels to reveal several in die cast form on some makes of cars. They include worms and gear segments and housings for these parts, used in window regulators and for ventipane regulation. Many makers use several die castings per car for door latch parts, and lock parts have long been produced in die cast form to bring their cost within moderate limits. Exposed hardware parts, such as door handles, both interior and exterior, window regulator cranks and butterflies, trunk hinges and the like continue to be die cast by the million, many of them on mechanized production lines which carry the die casting through light machining, polishing and plating operations in the space of a few hours.

To summarize, it is evident from the foregoing that the die casting is employed in automotive vehicles for two primary reasons: First, it is structurally and mechanically sound and dependable; second, it is highly economical to manufacture. Both these conditions are essential to gaining the wide use referred to. In addition, and in some cases almost as important, is the adaptability to production in pleasing shapes and to taking a plated finish which is enduring and appealing to the eye. Uniformity and accuracy in dimensions from the first to the final casting, no matter how long the run may be, are not inconsiderable advantages. Clearly, the supposition that the die casting is primarily decorative in character and utility is wide of the truth. This is visually demonstrated by reference to the accompanying illustrations showing only a small fraction of the types of automotive castings which are serving as mechanical parts of cars and trucks.

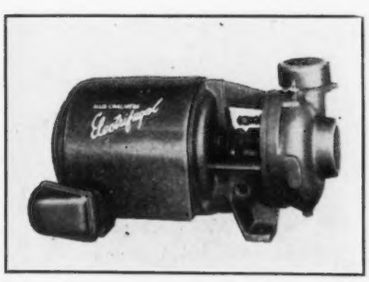
▼ ▼ ▼

New Equipment . . .

Plant Service Apparatus

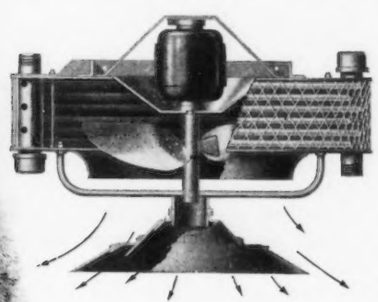
Here are described new developments in the sphere of factory service equipment such as pumps and motors, heaters and ventilators, valves and oilers. Also described are safety devices for the protection of workers.

COMPLETE centrifugal pump and motor unit on one shaft and in one housing is produced by *Allis-Chalmers Mfg. Co.*, Milwaukee, and called the Electrifugal pump. This pumping unit has a special motor with one-piece cast iron motor yoke and pump bracket. The special splash proof motor design with copper-bearing steel cover, meets NEMA specifications and is available in sizes from 1 to 10 hp. at 3500 r.p.m. and from ¾ to 7½ hp. at 1750 r.p.m. for heads up to 160 ft. Larger sizes are being designed. For normal service the pump is built with cast iron casing, bronze fitted. It can, however, be made in all iron, bronze, stainless steel or of other metal to suit any industry and can also be supplied with totally enclosed, fan cooled or explosion proof motors.



New Ventilator-Heater

DOWNBLAST speed heater is name of a new *unit heater* recently developed by the *B. F. Sturtevant Co.*, Hyde Park, Boston. This heater projects heat directly downward, resulting in more efficient heating in buildings with high ceilings. Effective heating can be obtained up to 40 ft. above floor level. At lower levels the installation of deflection cones results in wider diffusion of the heated air stream. The cold air is drawn in by an aluminum fan and passes through the heating element consisting of a coil of copper steam tubes.

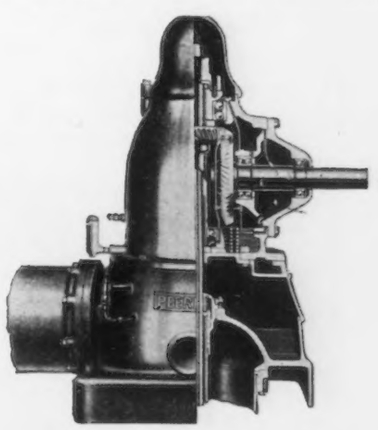


Gas Fired Heaters

GAS-FIRED unit heaters for use in offices, factories, storerooms, etc., have recently been designed by the *Reznor Mfg. Co.*, 151 James Street, Mercer, Pa. The new heaters need no water or steam for operation and are constructed to throw heat evenly over large areas. Three types, equipped with either induction fan or blower, or for duct installation without either, are available in five sizes each and provide from 55,000 to 200,000 B.t.u. per hr. In these heaters cool air is driven over the streamlined heat exchanger into the room. Products of combustion are carried directly over the heat exchanger into the flue chamber and then to the chimney. They never come in contact with the air to be heated.

Improved Pump Head

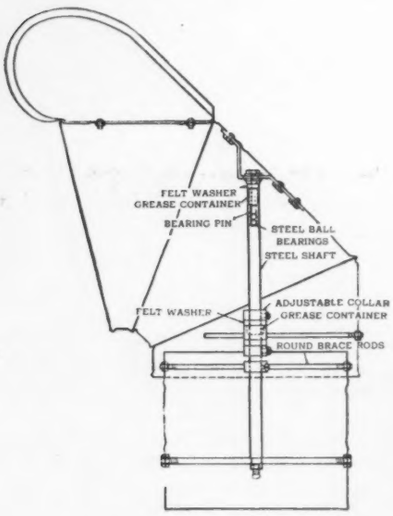
DESIGN of the geared head in deep well turbine pumps has been improved by the *Peerless Pump Co.*, 301 West Avenue 26, Los Angeles. The take-off shaft of the pump is designed for increased loads. Double-row ball bearings and plate thrust bearings carry the shaft loads. Oil pressure system provides cooled oil for both bearings and gears. Standardized speed ratios of 1 to 1, 1 to 1 1/3, 1 to 1½, and 1 to 2 are provided. The head, known as the Gearturbo, provides for the connection with a flat belt pulley, V-belt or for direct connection to any power unit.



Improved Ventilator

A REDESIGNED Nu-Alpina ventilator is announced by the *Milcor Steel Co.*, Milwaukee, for the ventilation of industrial buildings. Operating on the air-siphon principle, the ventilator always turns the revolving head so that the flue opening is facing away from the wind, thus creating a

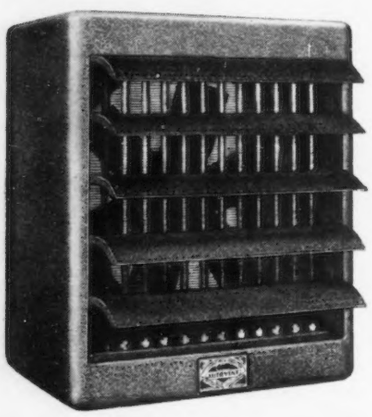
natural vacuum which draws the air out of the building. In the new design the revolving head is sus-



pended on a ball-bearing pivot. This design increases the sensitivity of the ventilator and the exhaust output.

Steam Unit Heater

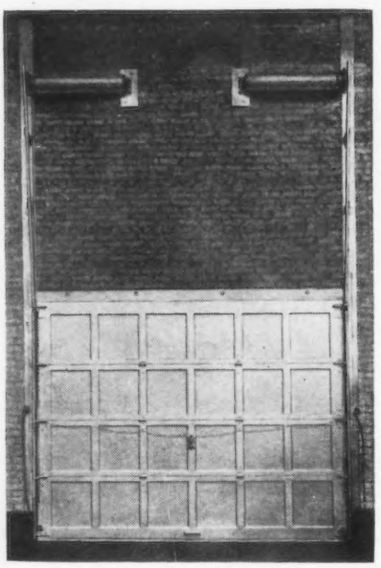
REDESIGNED line of steam unit heater has just been announced by *Autovent Fan & Blower Co.*, Chicago. The heaters are installed to stop drafts, eliminate ex-



cessive moisture and to lessen heat losses through frequently opened and closed doors. Each item of the assembly has been die-formed and the vanes have been recessed. They are individually adjustable. The heating coils are tested at 500 lb. hydrostatic pressure and provide efficient heating at any steam pressure from 2 to 150 lb. gage.

Spring Balanced Overhead Doors

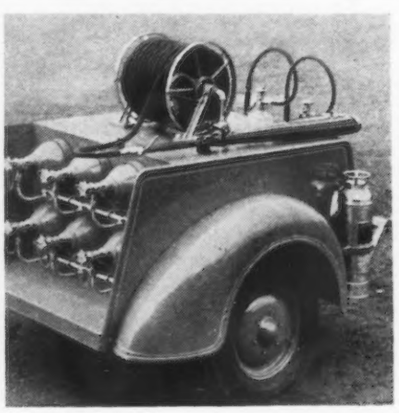
SPRING balanced vertical acting doors in which the balancing is accomplished by torsion springs coupled to graduated winding drums are offered by *Barber-Colman Co.*, Rockford, Ill. Airplane cables attached to the bottom corners of the door wind on the spirally graduated grooves of the winding drums as the door moves up or down. The graduated grooves are designed so that the lift on the cable remains constant even though the springs unwind as the door opens and wind up as it is closed. This tends to keep the door in balance in any position. Doors are equipped with a cam closing action which provides ½ in. clearance between door and stop strips while the door is mov-



ing, yet cams the door to a snug fit against the stops at the end of the closing stroke. Motor-operated as well as hand-operated types are available.

Versatile Fire Fighting Unit

FIRE fighting weapon has recently been perfected by *Walter Kidde & Co., Inc.*, Bloomfield, N. J. This mobile unit carries a battery of six 50-lb. CO_2-cylinders



equipped with 100 ft. of ½ in. hose and nozzle. Since cylinders are individually operated, the unit can be employed to a varying degree to extinguish the fire. Control of the discharge is effected by a shut-off valve on nozzle handle. For smaller fires two portable carbon dioxide extinguishers of 15 lb. capacity are carried on the front platform and two 2½ gal. water extinguishers operating on a syphon principle: a CO_2 cartridge can be released and it propels a water jet over 30 to 40 ft.

Synthetic Rubber Clothing

SYNTHETIC rubber clothing, providing protection which is claimed to be superior to the natural rubber product in certain applications, has been announced by *United States Rubber Co.*, 1230 Sixth Avenue, New York. Clothing is made of Synthal which is said to resist oils, greases, acids, alkalis and chemicals and is strongly resistant to heat, sunlight and aging. Seams of the clothing are vulcanized with a new curing element, eliminating stitch holes.

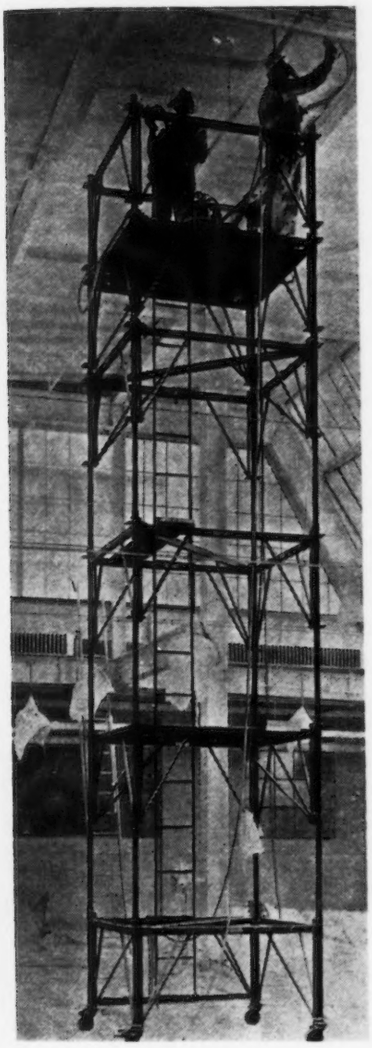
Fire Suit

ASBESTOS is used throughout in the Ipco emergency fire suit, produced by *Industrial Products Co.*, 800 West Somerset Street,

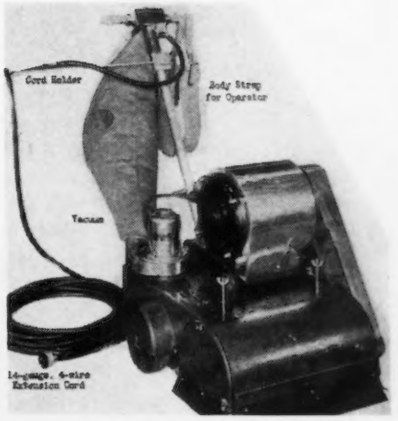
Philadelphia. It can be put on quickly and it allows full and comfortable fire fighting freedom. The helmet is equipped with a mica lens affording safe and full vision. Overshoes are lined with asbestos inner soles. The suit is designed to provide speedy and safe dressing.

New Steel Scaffold

SAFETY steel scaffold has recently been placed on the market by *Mechanical Handling Systems, Inc.*, 4600 Nancy Avenue, Detroit. Quik-Set safety scaffold provides interchangeability with a minimum number of separate units. No



screws, bolts or clamps are used, and no tools of any kind are required to erect or disassemble the scaffold which consists of square-section tubular steel brace and corner post units. They are designed for speedy assembly of the scaffold and to permit erection in straight line, in corners, around rectangular or circular constructions. Also provided are steel floor sections, detachable ladders, adjustment posts for erection on uneven surfaces, brackets for cat walks and for holding material, casters for use on interior work and a skip-hoist for lifting materials.



Floor Cleaner

DESIGNED for dry cleaning floors of industrial establishments the new model K of *G. H. Tenant Co.*, 2530 North Second St., Minneapolis, can recondition old wood floors or produce a smooth surface on new ones. Equipped with a steel wire brush the cleaning machine removes lubricating oil, steel chips and other heavy spillage. A power vacuum and collector pan picks up dirt. Steel wire brush, sanding drum and steel wooling roll have a width between 15 and 16 in.

Roto Power Sweeper

GENERAL purpose power sweeper, the improved Ideal Roto sweeper, manufactured by the *Ideal Power Lawn Mower Co.*, Lansing, Mich., sweeps an average of 36,000 sq. ft. an hour. It picks up both light and heavy dirt or gravel, iron filings, paper, sweeping compound and even snow. A sprinkler prevents the raising of dust by moistening the brush. Sweeper is equipped with a power driven rotary brush, 14 in. diameter, of special fiber bristles, which turns in a sense opposed to the direction of travel. The sweeper can be equipped with straight or angle type, bristle or steel wire brushes. The steel wire will cut grease and deposit it in the dirt box.

Floor Maintenance

COLORFLEX, an enamel like dye for floors, manufactured by *Flexrock Co.*, 23rd and Manning Streets, Philadelphia, has been made fire and acid resistant. Tests have indicated that the finish is not affected by heat, sulphuric acid or carbolic acid, etc. Colorflex is available in linoleum brown, tile red, emerald green and battleship gray. Improvements in the acid, alkali and fire resistance of Glasflex, a transparent floor finish, manufactured by the same company, have also been announced. The company claims that this product is now totally alkali and acid resistant.

Door Safety Control

IMPROVED automatic safety control has been developed for motor operated rolling doors manufactured by *Kinnear Mfg. Co.*, Fields Avenue, Columbus. Should doors be carelessly lowered on a person or a car, the

safety device causes the door to stop its closing travel, or immediately revert to its fully open position, depending upon method of connection to door control circuit. Operation of the safety device is controlled by a compressible, air containing, weather strip placed along entire length of bottom edge of door.

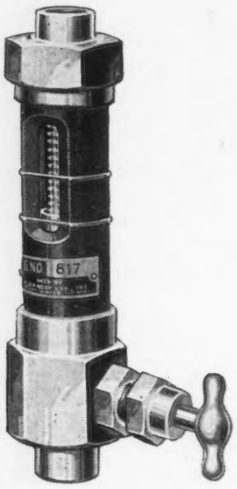
Synthetic White Color

ONE application of Kem Save Lite is claimed to give factory walls a hard tile-like white

surface which is washable. This color is made by the *Sherwin-Williams Co.*, Cleveland. The material dries overnight, lasts long and is claimed to reflect 89 per cent of light. It is supplied in gloss, eggshell and flat finishes.

Pressure Sight Feed Oiler

RECENTLY *S. F. Browser & Co., Inc.*, Fort Wayne, Ind., developed the Figure 817 pressure sight feed oiler, which is especially



designed for points of lubrication under or inside the machine. The operator can tell at a glance when oil is flowing to a bearing and by the position of the plunger its approximate amount.

Bronze Globe Valve

NEW bronze globe valve has been announced by the *Reading-Pratt & Cady Division* of the *American Chain & Cable Co., Inc.*, Reading, Pa. This valve has a hardened pull-plug type stainless steel seat and disk for throttling services on high pressure steam lines, and it is also suitable for lines which carry boiler scales or other gritty substances. Body and stem are made of hard bronze.

New Safety Gloves

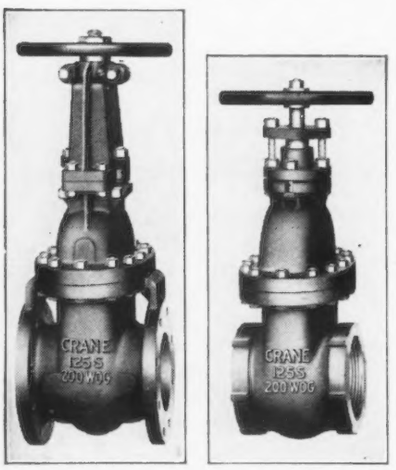
MILLER RUBBER CO., Akron, Ohio, is bringing on the market canvas gloves covered with neoprene in both the knit wrist and gauntlet types. They provide complete protection against oils, fats and greases, yet give finger freedom. Neoprene covering increases considerably the lease of life of the gloves when used against tough wearing surfaces.

Marked Shim Stock

THIN shim stock supplied in slotted cartons by the *Laminated Shim Co., Inc.*, Glenbrook, Conn., is furnished now plainly marked in inches on its edge—from 0 to 100 in. with ½ in. subdivisions—at no extra cost. Therefore the precision thin metal can be pulled through the carton slot conveniently and cut off to the exact size required. These handy packaged rolls of brass or steel shim stock (6 in. wide and 0.001 to 0.015 in. thick) facilitate storage, and save material and time.

Iron Body Wedge Gate Valves

FOR 125 lb. steam and 200 lb. cold pressure the *Crane Co.*, 836 South Michigan Avenue, Chicago, has just brought out a new and complete line of standard iron body wedge gate valves. Their design redistributes body and bonnet materials, eliminates all excess weight and yet complies with all standard requirements: Handwheels are of strong malleable iron; deep stuffing boxes permit a gen-



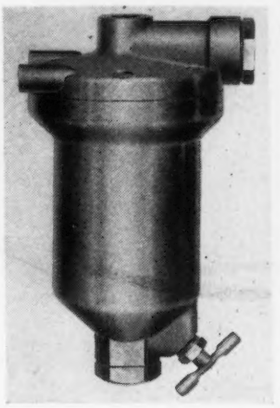
erous amount of packing; the body-bonnet joints employ a flat gasket closely bolted together so that any compression is evenly distributed; seat rings are of the shoulder type to retain tight contact with the body in spite of difference in expansion; all machined parts are precise in their fit and finish.

Aluminum Ladders

ALUMINUM straight ladders weighing 1 lb. per ft. but strong enough for all ordinary uses have been introduced by *Aluminum Ladder Co.*, 130 Adams Street, Tarentum, Pa. Ladder is constructed entirely of aluminum alloy 61 S.T. which has a tensile strength of 48,000 lb. per sq. in.

Water Drain for Compressed Air Lines

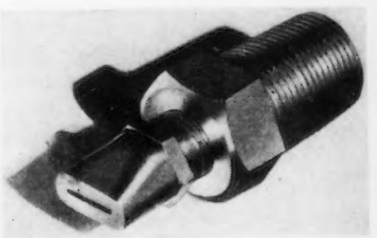
AN automatic water drain for use with compressed air lines, simple in construction, and efficient in operation, is being marketed as type HOD by the *DeVilbiss Co.*, Toledo. This new unit, which is



available with four convenient fitting assemblies, is intended for installation in air lines, air compressing outfits, or air receivers in order to prevent water from being carried into the tool. It is operated automatically by a slight fluctuation of the main line air pressure. A variation of 5 lb. is sufficient for its operation. A manual drain is provided for use in periods when the main air line is not used.

Spray Nozzles

A NEW type spray nozzle for both low and high pressure service for spraying either water or oil has been introduced by *Trabon Engineering Corp.*, 1814 East 40th Street, Cleveland. Nozzle consists of two parts, a stainless steel header adapter and a nozzle forged from a solid monel bar. Nozzles are manufactured with several sizes of orifices, so designed that they effectually control the pat-



tern of the spray, and delivery is the same thickness at the sides as in middle of the spray.

(Other plant service apparatus will be described next week.)

MORE THAN MEETS THE EAR
Getting the right metal for a door chime sounds like a simple problem. But is it?
By no means as we found out. In spite of the fact that here at Revere Copper and Brass Incorporated we have amassed over the years a most comprehensive file of data on copper and its brood of alloys, the problem of the right metal for a door chime called for new research.
An exhaustive investigation was undertaken. It was necessary to consider the resonant features, the length and strength of overtones, the surface finish, the machining qualities, and the material and production cost.
In all—even with the head start we had from our data—over six different alloys and numerous tempers, comprising thirty possible combinations had to be tested, before the right alloy, with the right sound, at the right price, was selected.
There has long been a need for someone to amass the multitude of data on copper and copper base alloys; and to use this mass of knowledge as the springboard for practical research to solve a myriad of today's defense, industrial and manufacturing problems.
Revere Copper and Brass Incorporated has done this. Valuable as this knowledge is, our willingness to undertake practical industrial research in tackling a problem on which we don't have facts is of greater value. And, as you see, even a door chime gets the right service at Revere.
REVERE
COPPER AND BRASS INCORPORATED
230 Park Avenue, New York, N. Y.
Sales Offices and Distributors in most of America's major cities
MILLS: BALTIMORE, MD. • TAUNTON, MASS. • ROME, N. Y.
NEW BEDFORD, MASS. • DETROIT, MICH. • CHICAGO, ILL.

On The Assembly Line

BY W. F. SHERMAN
Detroit Editor

• Work on three of major defense projects in Detroit area is on schedule . . . Swing to higher automobile prices has become definite . . . Ford-CIO contest is waging bitterly . . . Automobile output, totaling about 535,000 cars and trucks, breaks all January records.

DETROIT — Progress reports have been made on three of the major defense building programs under way in the Detroit area. They indicate that work is on schedule in every instance, actually ahead of schedule in two cases. One of the projects has gone nearly through the bricking stage, the other two marked the setting of the final rivets and steel work last week.

Packard, with the earliest start, has nearly finished two of the three buildings which are being added to the Packard plant for manufacture of the standard Merlin 30 Rolls Royce aircraft engines. The largest of the three buildings, the main assembly plant on Harper Avenue, has been bricked and roofed, and the flooring and interior are being finished now. The heat treating and machine shop near the south end of the Packard property is at the same stage of construction. The new test cells, together with tear-down, reassembly and shipping facilities, will be in a third building for which erecting of steel has just been finished. These buildings represent 500,000 sq. ft. of floor space, half of the 1,050,000 sq. ft. needed. Parts of the Packard auto plant will be utilized for the rest.

Steel Erected for Chrysler Arsenal

Last week the final rivet was placed in the steel for the Chrysler tank arsenal on which work was begun on Nov. 18. Work is ahead of schedule, according to Maj. Harry R. Kadlec, constructing quartermaster. Obviously working under "forced draft," contractors and Chrysler executives have succeeded in setting an unusually rapid pace by adopting unusual procedures in several instances. Most dramatic was the step they took to supply heat in the section of the plant which was bricked earliest. With the power plant under construction and not in service, they got a steam railway locomotive, ran it on rails into the plant, put an extension on the stack to carry smoke out into the open air, and "got up steam." This has provided heat for the one-third of the arsenal which is now enclosed—with glass on three sides and a temporary partition on the fourth side.

Into this blocked-off section of the plant Chrysler has already moved a lot of equipment and vendors are shipping in more machinery daily. As rapidly as concrete floors are poured and set, machinery is unloaded from trucks or rail and lined up ready for installation. Swathed in heavy coverings to protect them from the weather, the machines present a strange appearance; outstanding among the many unrecognizable machines in their wrappings, the radial drills look like prehistoric monsters standing guard over squat grazing animals.

By Feb. 10, it is estimated, floors will be completed in at least a third of the plant. The power plant will go into service shortly thereafter. The plant should be all glazed by early March. It covers 700,000 sq. ft. and required 6500 tons of steel, supplied by Bethlehem.

Four days ahead of schedule, the final girder was swung into place for the Ford airplane engine plant at the Rouge. In less than two months (with 10 days lost on account of weather) American Bridge Co. erected 8791 tons of steel for this plant. Contracts call for completion of the building by late March.

All kinds of tricks have been used to get around the ever-present problem of winter weather. One was Chrysler's portable heating plant (the locomotive). Another was the erection of a temporary shelter to cover the entire Ford building as soon as the main structural steel work was up. Exterior walls and roof were covered with 900,000 sq. ft. of fiber board, providing shelter and comfort for workers and permitting completion of brick and concrete work in the worst of Michigan winter weather.

Unusual, cost-disregarding cooperation of a firm erecting steel for one of the "rush" defense plants in southern Ohio has also attracted attention. In this case, routine was upset completely by the steel erectors to put the exterior framing up first, so bricking of the walls could be started immediately. Then the steel men worked inside the shell of the building, erecting columns and placing roof trusses.

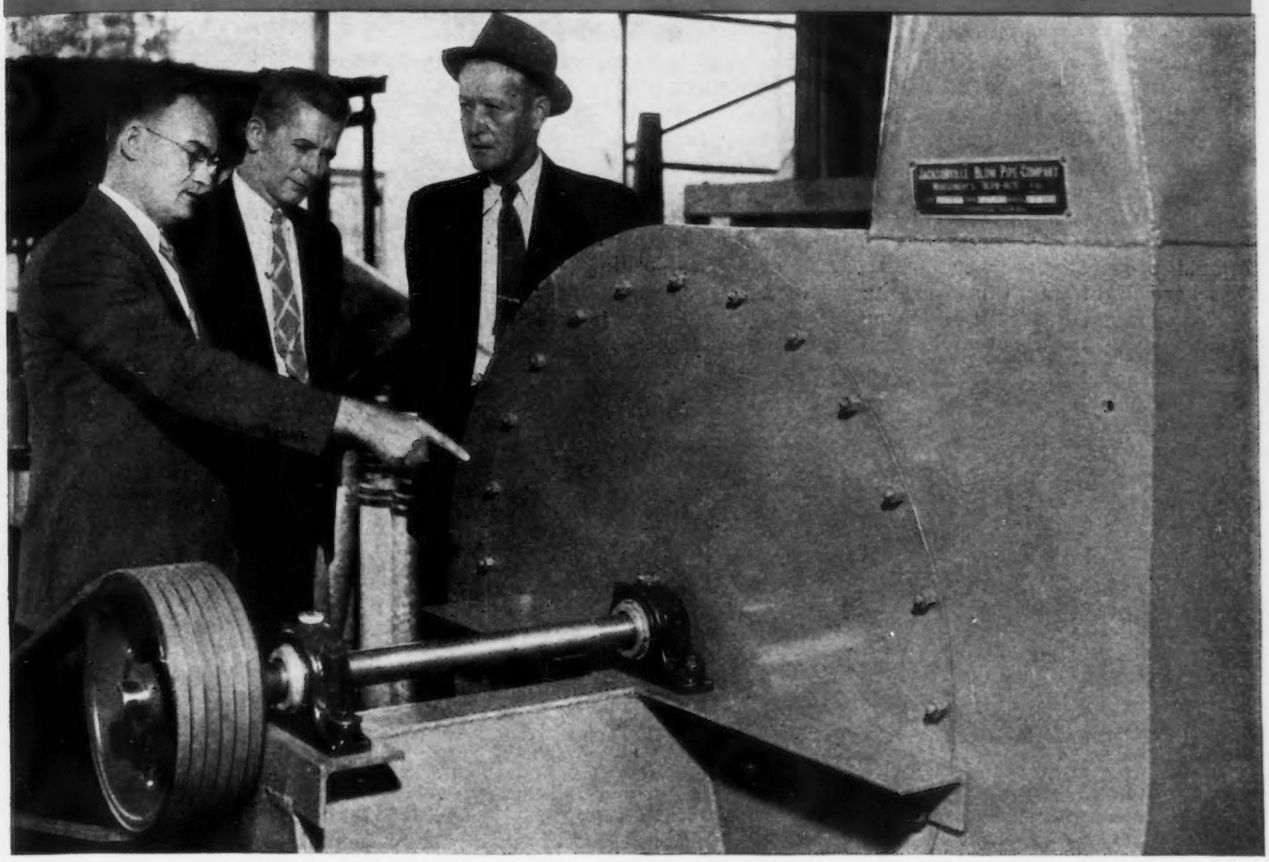
"Business As Usual" Idea Abandoned

Probably many similar cases of special cooperation in the defense program could be cited, and all are good evidence that business here has abandoned the "business as usual" attitude in favor of "all out."

In Detroit, new car announcements continue to hold attention. During the week that Buick and Pontiac told the public about their new body styles, Willys announced a new coupe priced $70 below the sedan model. It is offered in one color only, "Americar blue" and is undoubtedly intended to be the price "leader" to focus buyers' attention on the entire line of cars.

Incidentally the swing to higher auto prices has become definite, with two manufacturers already known to have put increased prices into effect. Another has shunted aside dealer attempts to place orders for a four-to-six week supply of new cars, and the assumption is that in this case there will be higher factory prices soon. In still other cases, manufacturers have already told distributers that higher prices

You Pay the Same for Power--Delivered or Dissipated!



"Our Customers Tell Us We Picked the *Right Bearings*"

. . . says Mr. Montgomery

The Jacksonville Blow Pipe Co., Jacksonville, Florida—manufactures exhaust fans that can "take it" — from chips to wet sawdust that get into the pipes . . . these fans ably cope with gruelling service. Naturally the bearings used on these fans must be equally rugged and trouble-free. And they are — for they are Dodge-Timken Double Interlock Roller Bearings . . . known for unfailing operation. Mr. Montgomery, President of Jacksonville Blow Pipe Co. — Mr. Stoner, Dodge Representative, and Mr. King, Dodge Distributor Salesman — "talk over" this installation.

Mr. Montgomery: I can see now why you recommend Dodge Double Interlock Bearings for our fans. Our customers tell us that our fans are taking punishment, the like of which they've never seen.

Mr. King: And they will continue to do so — for Dodge Interlock Bearings are fully self-aligning . . . and are designed to give 30,000 hours of service under conditions for which they are adapted.

Mr. Stoner: Besides, these bearings are effectively "sealed" against dust and dirt and other destructive elements. They are prelubricated and easily mounted.

Mr. Montgomery: One of our customers who used $1000 worth of oil on babbitt bearings says he'll cut this to $50 now. Dodge Double Interlock Bearings are giving us more than double value.

There is a Dodge Rolling Bearing for every industrial service — each one designed for a life expectancy of 30,000 hours under conditions for which they are adapted. Write for selection tables which make it easy to pick the right bearing for any job.

DODGE MANUFACTURING CORPORATION
MISHAWAKA, INDIANA, U.S.A.

THE RIGHT DRIVE FOR EVERY JOB

are on the way. Dealers are taking full advantage of rumor and fact to capture additional customers and are succeding in their attempts to keep sales at phenomenal levels for the winter season. In addition, published reports have indicated that a 5 per cent federal tax on new cars is likely to be imposed shortly.

The assumption that Packard's pre-occupation with defense work would prevent appearance of the Packard light car this year has been proved wrong. It is learned that Briggs is proceeding with buy-

TWINS—THE NEW BUICK (above) Series 40 (A) and the Pontiac Metropolitan Torpedo sedan (below) are four-door, four-window models just introduced. Chevrolet will announce the same body style as an addition to its lines of cars also.

ing and other preparations for producing bodies for this light Packard. The new car, so long rumored, may be "just around the corner." In the Chrysler line-up, mentioned last week, it appears that the new engine will be an eight-cylinder powerplant destined to be an addition to the Dodge line.

The Ford six, which is due for its introduction soon, is already being installed in Army cars, apparently as a step in the direction of standardization of military equipment. (Other cars and trucks in similar weight classifications are using six-cylinder engines.)

gray iron. The military trucks in a similar size use about 15 to 20 per cent more material because of heavier construction and added parts.

In the case of the 1½-ton (rated) truck, steel ordinarily used is about 5000 lb., and iron is about 1000 lb. In military trucks, materials used weigh about 10 per cent more for this weight classification.

Ford—CIO Contest Bitter

One of the most bitterly contested industrial arguments in history and one of the most dramatic appears to be nearing a climax on stages set in Detroit and Washington. Guerrilla warfare between the UAW-CIO and Ford Motor Co. has turned into a pitched battle with every indication that this battle will bring about a showdown if either side can arrange one. The UAW has set its sights on Ford with loud-spoken determination to bring about capitulation to union terms. Ford's resistance has stiffened by the hour during the past few weeks and each day has brought important new developments. Rumor has it that Henry Ford will give his plant to the government or close it down entirely before he will yield to the CIO. One who has felt the CIO pulse would say that there is in the CIO just enough conceit in its own ability to run a plant so that some elements would like to have a development like that occur in the present controversy. More typical of Ford and representative of his attitude is the report that in Georgia late last week he offered to make all the defense equipment the government wants without profit, suggesting that other manufacturers do the same. . . .

Record January Output

Automobile production continued through late January at the fastest pace in history for any January week, reaching 124,400 units according to Ward's Automotive Reports. This compares with 121,948 in the previous week and 101,240 in the corresponding week of last year. The previous January record was set two weeks ago at 124,025 cars and trucks. Production for the entire month is estimated at 535,000 cars and trucks, by far the largest total ever reached in January of any year. The previous record was 449,492 units established last year. The projected output of 500,000 units for February promises to establish a record then too.

Speedup Sought in 1942 Engineering Classes

• • • **Speaking on national defense** before the engineering groups in Syracuse on Jan. 28, William A. Hanley, president of The American Society of Mechanical Engineers, advocated graduation of the engineering classes of 1942 at least three months in advance of the regular date. Mr. Hanley said that 14,000 engineers will graduate from universities in the U. S. in 1941 but many more will be needed.

Deep drawing qualities like these

MAKE PRODUCTION EASIER

WHEN you want the corrosion resistance of Stainless Steel—but are stopped by the apparent difficulties and cost of deep drawing—remember that you can do the job more easily with Carpenter Stainless Strip.

For example, the difficulty of deep drawing the parts of this cream separator would bar any Stainless Steel except the very best. Carpenter Stainless Strip does the job because of its uniform dead-soft temper and freedom from hard spots. Deep drawing, bending or forming is made easier by these qualities—which pave the way to increased output.

The satin-smooth finish of Carpenter Stainless Strip reduces finishing time to a minimum.

To help you fabricate Stainless Strip, Carpenter has amassed a fund of valuable information on tooling, drawing compounds, polishing and buffing procedure, etc. This information is available from your Carpenter representative. Consult him about your Stainless problems.

THE CARPENTER STEEL CO., Reading, Pa.

Carpenter STAINLESS STEELS

BRANCHES AT Chicago, Cleveland, Detroit, Hartford, St. Louis, Indianapolis, New York, Philadelphia

Washington

BY L. W. MOFFETT
Washington Editor

• Efforts of congressmen seeking patronage benefits from defense should be resisted . . . Uncontrolled building of new plants seen creating after-war "ghost towns" . . . Cooke warns against draining of skilled labor from industrial centers.

WASHINGTON — In the Senate debate last week on the bill authorizing appropriations for the construction of some 400 small vessels for the Navy there was considerable discussion regarding where the vessels should be built. Naturally each senator who talked on the matter said he was willing to leave the question to the determination of the expertly informed Navy Department, and that he would certainly do nothing that would hamper the national defense program. At the same time, while denying that he was appearing in the role of a "special pleader" for his state, the particular senator who was talking smoothly edged in arguments for the particularly suitable facilities in his section to build the vessels—or at least some of them.

The New England, Great Lakes, and Middlewestern sections all were adequately represented, and there can be no doubt that there were some good arguments made.

Nevertheless, the point is that politicians, who are so quick to score manufacturers for making "unconscionable profits" out of a national emergency, are given altogether too much to pleading for location of defense plants and work in their own sections of the country. This advocacy is natural, since a great deal of pressure for plant location originates with constitutencies and unless they have representatives in Congress who will present their case, the political lives of such representatives may well be at stake.

Patronage Drive Should Be Resisted

The fact remains that this old time practice of seeking patronage benefits from the defense situation is something that deserves to be resisted just as strongly as is the rightfully determined effort to prevent undue profits from war contracts. The member of Congress, just as the individual or civic organization sincerely contending for plant location is entitled to a fair hearing and due consideration without condemnation of motives, but at the same time the final determination of the question should be left to the military sources who are qualified to pass on the subject from a point of national defense.

The question involves more than that of emergency needs. It involves, as has been pointed out, "our national economy based upon private capitalism and its functioning within a democratic framework." Under the best of circumstances the armament effort will be upset. If there is to be a general, hit-and miss system of building plants regardless of the merit of location, this economy will be more greatly deformed, over-expanded in some ways and shrunken in others.

Civilian requirements in some lines are going to have to be tapered temporarily but the supply of such requirements to the fullest degree possible without sacrificing defense needs obviously is a desirable end. One way to do this clearly is to avoid building new plants as much as possible for they will be worse than useless after the need for the defense program has come to an end. Depriving one area of its labor supply not only dislocates labor and investment but creates unnecessary housing shortages in another area whose "benefits" are impermanent and become definite liabilities.

Whatever the benefits of decentralizing industry, they will not be achieved through these channels. Rather they will have to be based on a peace-time, normal economy.

There are socalled economists who are arguing that the steel industry should be broken into "bits and pieces" to "promote" defense production. The National Economic and Social Planning Association, in its reckless proposal for a 20 per cent expansion in steel capacity, suggests that new furnaces and mills be built where they will be most needed and useful. The industry has been of the impression that it has built plants where they will be most needed and useful for reaching markets, but it doesn't want to gamble on investments to toss up plants like mushrooms where they will have no relation to sound production or economy and will only make possible more "ghost towns" after the war.

CIO and SWOC President Philip Murray long has complained of what he calls steel "ghost towns" and in his plan for "organizing" the steel industry he proposes that facilities in these towns be brought back into production. He agrees with the NESPA regarding nationalization of the steel industry, though the idea of constituting the entire industry into a single unit must be a shock to Trust Buster Thurman Arnold. But Mr. Murray sharply disagrees with his colleagues of NESPA about building new plants, which would not only shift labor and investment but involve a waste of time, steel, machinery and labor in building and equipping new plants.

Revival of Ghost Towns Sought

Defense Commissioner Hillman, himself prominent in CIO Councils, also is trying to revive "ghost towns" and strongly opposes the unnecessary creation of new plants. Morris L. Cooke, Mr. Hillman's engineer consultant, has made a strong case against the building of unnecessary plants, which it would be well for members of Congress to heed. Heeding it, they will be less

If you work to 1,000ths of an inch . . .

HERE'S WHAT YOU SHOULD KNOW ABOUT FLUORESCENT LIGHTING!

QUESTION. ***What is fluorescent lighting?***
ANSWER. G-E Fluorescent Lighting is a brand new source of illumination—a source in which the light is produced not by a filament, but through fluorescent powders coated on the inside of long glass tubes. These powders convert invisible ultra-violet energy into visible light.

IN THIS *"life-test"* G-E MAZDA F *lamps burn day and night to help assure the high standards set by G-E research.*

Q. ***What are its advantages for me?***
A. Its higher efficiency and greater coolness permit factories, mills, and shops to have higher levels of illumination, with less glare, than has ever before been practical. Since people see faster, with less fatigue in better light, you should expect increased production, fewer rejects, fewer mistakes, and improved employee morale when fluorescent lighting has been properly installed in your plant or shop.

Q. ***Why should I insist on G-E MAZDA Fluorescent Lamps?***
A. G-E MAZDA F lamps are the latest product of General Electric Research and Development — a combination which for 61 years has been giving America more and more light at lower and lower cost. Since G-E MAZDA F lamps were introduced in 1938, efficiency has been increased as much as 40% and prices reduced as much as 45%! Today's G-E MAZDA F lamps are made to give maximum light output for current consumed—made to *stay brighter longer!*

Q. ***What about fixtures?***
A. You can choose from a wide variety of individual styles. General Electric cooperates with many fixture manufacturers, and does not make fixtures itself. Your G-E MAZDA lamp distributor can supply styles and types to fit every business—complete with G-E MAZDA F lamps, all ready to use.

Fixtures bearing the Fleur-O-Lier or RLM tag assure you of maximum fixture performance because they are certified by Electrical Testing Laboratories to comply with exacting specifications. Such certification may be obtained by any fixture manufacturer whose product meets required specifications.

HERE *a skilled technician places a 100-watt* G-E MAZDA F *lamp in giant "electric eye" that measures light output.*

THIS MACHINE *tests brightness of fluorescent powders used in* G-E MAZDA F *lamps to assure maximum light output throughout life.*

Q. ***What should I do now?***
A. See your G-E MAZDA lamp distributor. He can help you choose the fluorescent fixtures that exactly meet your needs, and he can draw on all the resources and experience of the General Electric Company to see that you get the best possible fluorescent lighting properly engineered to your needs — at the lowest possible cost. Your local lighting company can also give you valuable advice.

G-E MAZDA F LAMPS *are recommended for use only with equipment providing good power factor, such as Fleur-O-Liers or RLM Industrial fixtures. The label shown here identifies Fleur-O-Lier fixtures, made by over 35 experienced manufacturers.*

G-E MAZDA LAMPS
GENERAL ELECTRIC

likely to plead for needless plants in their particular sections.

Mr. Cooke after pointing out that unnecessary building of defense plants would mean mass immigration of hundreds of thousands of workers to these newly created industrial plants, said in a recent radio address:

"Just as serious as the situation created in the new locations will be the effect such migrations will have—indeed are today having—on the communities from which these workers will be drained. Old established plants will be deprived of the skilled labor and supervisory personnel without which they can no longer operate. Merchants would lose their customers. Real estate owners would be left with empty properties on their hands. In fact, the economic life blood would be drawn off from these established communities leaving them helpless victims of a program which would and should be so directed as to revitalize their existence."

Local leadership can help in solving these and various other problems connected with defense, Mr. Cooke believes.

Spreading Out of U. S. Orders Sought

Washington

• • • **With intensification** of the "farming out" program the National Defense Advisory Commission expects to speed up the defense production greatly.

The "farming out" policy is being directed by Labor Defense Commissioner Sidney Hillman, Associate Director of the Office of Production Management. At the request of Mr. Hillman, a system of defense orders has been worked out by Morris L. Cooke, Consultant on Management Engineering, who is on Mr. Hillman's staff.

Mr. Cooke told THE IRON AGE that his organization is watching community organizations in some stage of development in more than 100 locations. Of this number, 15 appear to have promising potentialities. He has purposely "held back a bit" in developing the program, he said, explaining that Army and Navy schedules have been constantly changing and that the farming out program necessarily takes considerable time in getting under way. He regards the trend in the direction of more subcontracting as inevitable, however, and points to the wartime experience in England, Spain and Germany.

Some experts estimate that the area in which 75 per cent of defense orders have been placed in this country is no larger than England, and insist that there must be a **greater geographical distribution of orders** through the farming-out process and subcontracting.

A number of laws on the statute books have been analyzed by Mr. Cooke with a view to determining whether there are any statutory barriers to the program. It has been found, for example, that the Walsh-Healey Public Contracts Act is inapplicable since contractors doing business with a direct government contractor are not subject to the law's maximum hours provision and to the machinery under which minimum wages have been established in some industries.

Mr. Cooke said that the question of possible anti-trust law violations under the farming-out procedure had not come up although he saw no reason for difficulties in that respect. In his opinion, putting old plants into operation will insure an increase in competition rather than constituting a restraint of trade through centralized management and control. The latter is not contemplated under the program, Mr. Cooke said.

On the general subject of the Justice Department's attitude on anti-trust laws in the face of the defense program, Assistant Attorney General Thurman Arnold has cited several Supreme Court decisions handed down during the World War in which the court held that a combination ordinarily in restraint of trade would not be deemed in violation of the Sherman Act if the combination was dictated by the necessities of defense. In other words, any step certified as necessary under the defense program would not be considered an unreasonable restraint of trade within the meaning of the anti-trust laws.

Mr. Cooke said that the first

THE BULL OF THE WOODS — BY J. R. WILLIAMS

UNTIL THEY DROP A BOMB ON ME, I INTEND TO MIND MY OWN BUSINESS! AND UNTIL THEN I REFUSE TO WORK ON WAR WORK!
O.K., DAVE, IT'S YOUR OWN BUSINESS!
HE CAN'T BE INTELLIGENT OR THEM FEW WORDS WOULD MAKE HIM STAY AND BUILD BULLETS OR BAYONETS IF THEY NEEDED 'EM!
I CAN'T IMAGINE A GUY IN HIS PLACE IN EUROPE BEIN' TOLD IT'S YOUR OWN BUSINESS-- THEM WORDS WOULD MAKE ME DO MOST ANYTHING TO KEEP FROM LOSIN' 'EM!
GUNE OIL
THE UTOPIAN
J.R.WILLIAMS
COPR. 1941 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.
2-7

U. S. Can't Afford One Day's Loss By Strikes

Chicago

• • • "Asserting the nation cannot afford the loss of one day's production at any of the plants turning out military essentials," Robert P. Patterson, Assistant Secretary of War, told the Chicago Federation of Labor that a policy of "talking out" instead of "walking out" is spreading. "To reach the point where our democracy is no longer in danger requires national unity, and for unity we must have industrial peace," the official said.

thing the staff of management engineers did was to make a rapid survey of the experience of this country with "farming out" during the last war and the experience of Great Britain and Germany during the current struggle. It found that "farming out" had been developed most extensively in Germany, where preparations for total war had been going on with great thoroughness for at least five years before the war actually broke out.

Great Britain also, Mr. Cooke said, has gone a long way toward a complete farming out program. The tremendous speeding up of plane production in England which followed the collapse of France was attributed in great measure to England's "bits and pieces" program by which production of aircraft parts is divided among thousands of shops scattered about the country. Every tool which can be used to turn out these parts, it was stated, has been brought into production. Even hosiery mills were said to have been adapted to fit into the job.

The Defense Commission's engineering staff then found out what facilities and men were available for a farming out program in this country.

"We first made some quick 'check-tests' of those areas where we were most likely to find communities where machines and men had been left idle by technological improvements and declining industries," said Mr. Cooke. "These check-tests uncovered a huge reservoir of unused productive power waiting to be tapped for defense.

The defense program of industrial production again emphasizes the critical need for a thoroughly reliable means of checking the lead of screw threads and rack teeth.

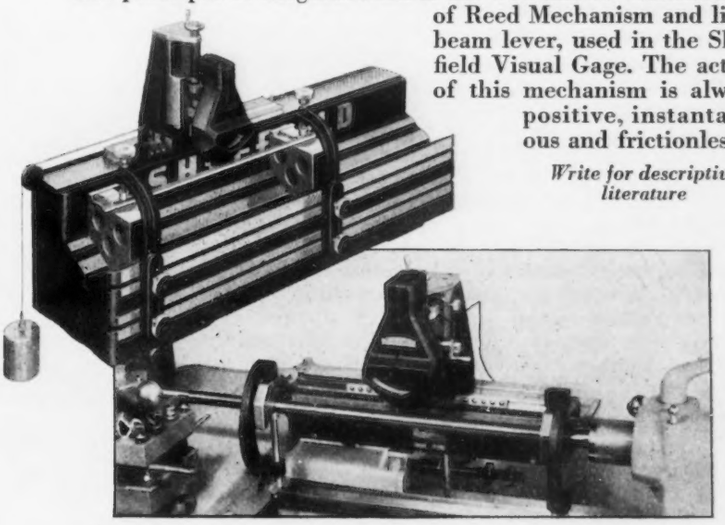
The Sheffield Thread Lead Checking Instrument is the ultimate in accuracy and speed—checking with precision gage blocks as the reference. And no special skill is needed, for anyone familiar with inspection procedure can handle this instrument.

There are two models, one for use on the bench, and a portable model which may be used on work still in the thread cutting machine, without removal.

The bench model handles screws up to 6″ in diameter and 30″ in length. The portable model handles screws from 1″ to 4½″ in diameter or from 2″ to 6″. Twelve inches of screw is checked at one setting by either model. For screws longer than that more than one setting is made.

The principle of magnification is the well-known combination of Reed Mechanism and light beam lever, used in the Sheffield Visual Gage. The action of this mechanism is always positive, instantaneous and frictionless.

Write for descriptive literature



SHEFFIELD
GAGE CORPORATION • DAYTON, OHIO, U.S.A.
MASTER GAGEMAKERS

Fatigue Cracks

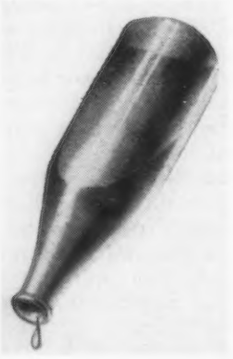
BY A.H. DIX

Mundane Misery

• • • *"Trenton Makes—The World Takes"* is the modest motto of New Jersey's capital city. But something went wrong with one of the letters in the giant electric sign on the bridge over the Delaware River, and when Associate Editor Frank Oliver saw it the other night from the window of a Pennsy train, it shouted this truth in letters 20 ft. high, "TRENTON MAKES—THE WORLD AKES."

Bewildering Bottles

• • • An ad that bothered us for a long time was the one showing a bottle of Wilson's rye tilted at an angle of about 20 deg., with the surface of whiskey near the top of the bottle responding to the tilt instead of following the law that liquids find their own level. We are happy to report, however, that this has recently been corrected and recent ads show that gravitation affects Wilson's rye.



Now we find ourselves worrying over the bottle in the Wean Engineering Co. ad on the front cover of the Jan. 23 issue, the one headed "Eliminate Bottlenecks in Sheet, Strip, etc." The bottle, you will notice, is still at least half full, but the contents are flowing out only at eye dropper pace. We wonder what liquid would act this way. Molasses in January?

Last Straw

• • • Your favorite family journal never was one to load you with subscriptions. On the contrary it urges you to make each copy go as far as possible, and to further this end it will supply you free of charge with specially printed routing slips bearing your company name and the names of individual readers.

But it recognizes that there are cases where single copies are being overworked, and where constant borrowing may lead to bad feelings. Take, for example, the fate of Newspaper Publisher John S. Knight's chauffeur, Jack Meanes, who was shot dead in Miami the other day. Stanley Sykes, another chauffeur, accused of the killing, is quoted as saying:

> "Meanes had been using my towels and toothpaste for the past year and I was tired of it."

If you need routing slips, write to us at 100 E. 42nd Street, New York City, for a listing blank, or just send in the list of readers. If you want to get another copy each week, that will be $6.

Just a Whiff

• • • The next time Leon Wesley (see page 64) Moffett, your Argus-eyed observer of the Washington scene, calls on the Defense Commission we hope he will find out the right way of pronouncing the name of one of the two heads. We hear it called Nood'-sen, Nudd-sen, Kah nood' sen, and Kah-nudd-sen, and understand that all are wrong.

Rumor has it that you merely hint at the initial "k," but we would like to know how it is done, for "k" is an uncompromising letter. You either take it or leave it alone. As someone said about garlic, there does not seem to be any such thing as a little bit of it.

Greater Love Hath No Man

• • • And while you are over there, Moff, you might show the Defense Commission this letter we just got from a Michigan manufacturer:

> *"We do not want Government orders. We had one 21 years ago and it took us four years to get our pay. A burned child is afraid of fire. We believe in preparedness but want the other fellow to have the headache."*

Maybe a line on the bottom of the Government's requests for bids would help—"Prompt pay. Good credit. Look us up in Dun-Bradstreets."

Cut Plug Enunciation

• • • Speaking of garbled transcription, our friend Deac Miller says that once he received a letter from a publication whose slogan is "The Trade Authority." The letter spoke of the "So-and-so Journal, Betrayed Authority."

THE IRON AGE's parent firm is the Chilton Co. The other day a letter intended for us came in addressed to the Chiffon Publishing Co. Which reminds us that people are always calling up our Washington office, asking where they can get their fountain pens repaired. There is a pen manufacturer named Chilton.

Your Pipeline To The White House

• • • We are indebted to *Time* for permission to use this partial view of a White House press conference. You are represented there by Jim Ellis, one of our Washington editors. Jim is the arrowed individual who is rolling his eyes like a blues singer, and is just northeast of the anxious-looking lady in the upper left.

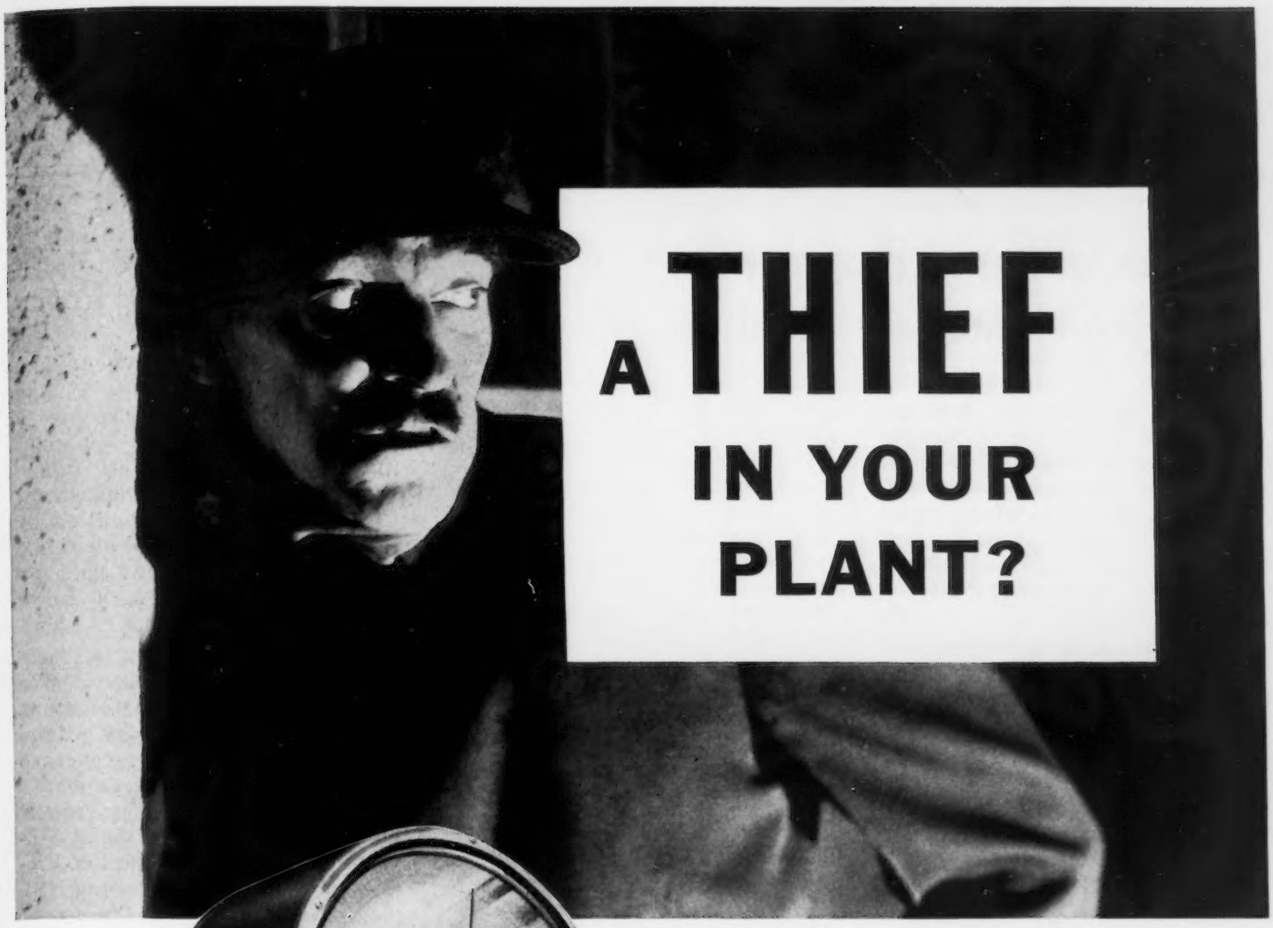
Say, Jim, did that stout fella in the foreground, who is bending over the presidential desk, ever find the cockroach he seems to be looking for?

Choler and Calm

In the same mail last week a letter came in from someone who lives on Mad Anthony Avenue, Cincinnati, and another from a man on Self Master Parkway, Union, N. J. The boys ought to get together.

Puzzles

• • • A man goes to a store and borrows as much as he has and then spends $20. He repeats this at a second and at a third store, and then has no money left. How much had he at the beginning?



A THIEF IN YOUR PLANT?

Fairbanks Dial Scale head with Printomatic Weigher. Weights and related data may be printed on tickets, roll tape, ticket and tape . . . even on sheets as wide as 18".

DO materials vanish mysteriously—inventories fail to check with stock records? It isn't necessarily a *human* thief that is causing these losses. *It may be a scale.*

In many plants, honest errors made in reading scales and in jotting down weights and later interpreting these hurried scribblings have been revealed as the sources of continual small losses that amount to important yearly totals.

How are these losses stopped? By equipping each scale with a Fairbanks *Printomatic Weigher.* At the touch of a button, the weighing operation is completed and an accurate *printed* record is made *automatically.*

For full information on these and other Fairbanks Scales, address Dept. B38, Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Ill. Branches and service stations throughout the United States and Canada.

7982-SA40.99

FAIRBANKS·MORSE SCALES

DIESEL ENGINES ELECTRICAL MACHINERY RAILROAD EQUIPMENT WASHERS-IRONERS STOKERS
PUMPS MOTORS WATER SYSTEMS FARM EQUIPMENT AIR CONDITIONERS

News of Industry . . .

Girdler Offers a Program for Assuring Adequate Steel Supply

Pittsburgh

• • • **Tom M. Girdler,** chairman of Republic Steel Corp., this week outlined for the Engineer's Society of Western Pennsylvania a "practical program for assuring an adequate steel supply" for all essential purposes over the months ahead. Principal points in his plans are:

1—Continuation by the industry of its normal policy of expansion and improvements where these are required to meet the defense need.

2—Utilization, when the need arises, of any capacity now idle, including any capacity which may have been considered obsolete but is still actually usable.

3—Increase of production from existing facilities by every means known to modern technology.

4—Cooperation from buyers of steel in placing orders only in accordance with their actual requirements.

5—Application of priorities in cases where unexpected defense orders appear for products already scheduled to meet anticipated requirements, or where non-essential civilian requirements stand in the way of defense requirements.

6—Continuation of harmonious industrial relations in the industry and throughout all of the important branches of the industry, including coal and ore mines, railroads and steamships.

"Excited and irresponsible talk of impending shortages and of the need for additional capacity has frightened a great many users into placing orders far in excess of their real needs," the Republic chairman told 1600 persons attending the Engineers Society banquet at the William Penn Hotel on Feb. 3.

The Republic official attacked the theory that the defense program "is going to make everybody rich" and said "it is stretching the imagination pretty far to expect a rise of non-defense demand for steel products to a peak beyond that of 1929. Even if the purchasing demand were available to multiply the demand for new automobiles and radios and refrigerators and bobby pins and permanent wave equipment, I question whether the manufacturing facilities, the manpower and the raw materials are available to make more and more of these things and at the same time supply the vast requirements for armaments.

"What is happening in this emergency is not the development of a steel shortage, but a return to the practice by buyers of anticipating needs and fixing of delivery dates well in advance."

Girdler declared that "there is no room for any who attempt to exploit the defense effort for the further socialization of industry, or for the organization of employees into labor unions, or as an easy road to exorbitant industrial prices and profits."

Girdler Says Pay Rise Would Start Inflation

• • • The problem of wage advances now confronting the steel industry is a problem of the millions of Americans who must pay for the defense program "with the sweat of their brows," Tom M. Girdler said Feb. 4 in an address at Pittsburgh.

"It may as well be recognized that increased wages, if forced upon the steel industry, not only would greatly increase the cost of national defense, but almost certainly would touch off a "vicious spiral" of inflation throughout the whole structure of our economy. In the end that could lead only to far-reaching disaster.

War Department Studies Labor Policy

Washington

• • • **The War Department** had under advisement this week the question of whether to require a uniform Federal labor law compliance statement in all future contracts, after the Department turned down a bid submitted by the Ford Motor Co., which had offered to supply 11,781 half ton trucks at a price $250,000 below the next lowest bidder.

"The matter is still in the making," said Undersecretary of War Robert P. Patterson in testifying before the House Military Affairs Committee. He readily conceded that the contract had been denied the Ford company at the request of Sidney Hillman, associate director general of the Office of Production Management. Mr. Hillman filed a similar protest with the department several weeks ago when a $1,387,500 order for 1500 midget scout cars was being negotiated, but at that time the department nevertheless awarded the contract. Mr. Patterson told the committee that denial of the truck order to the Ford company did not represent a change in War Department policy because the former contract was placed on a negotiated basis.

The statement on labor policy, which the department has attached to all contract invitations issued on a competitive basis, was approved by the National Defense Advisory Commission several months ago. Briefly, the stipulation requires that all defense contracts awarded by the government be carried out in compliance with all existing Federal and state labor legislation.

It was this stipulation to which the Ford company took exception when it submitted its bid on the truck order. The War Department construed this action to be a counter offer and awarded the contract to the next lowest bidder.

"The Ford bid was lowest," the War Department said in ex-

planation, "But inasmuch as it was not in accordance with the original proposal, the award was made to the Fargo Corp., of Detroit, the lowest bidder conforming to the specifications of the invitation for bids."

The contract, totaling $10,298,128, covers command-reconnaissance cars, radio trucks, ambulances, "carry-alls," and pick-up trucks.

After referring to the Ford case as "one of my particular headaches," Mr. Patterson turned to the proposal for curbing labor disputes on defense projects. He characterized as "exaggerated" reports that rearmament delays are resulting from labor troubles, and emphasized that he had no recommendations now for "coercive or compulsory" legislation to prohibit defense strikes.

This was the avowed intention of a measure introduced last week by Chairman Carl Vinson of the House Naval Affairs Committee. The bill, which would bar strikes in industries producing naval supplies until 30 days after a report of the dispute had been filed by a naval defense board, was expected to stand little chance of passing despite renewed expressions of legislative concern over labor disputes in the defense picture.

Simmons Co. Rolling Mill Strike Ended

Kenosha, Wis.

• • • **A three-day strike** in the rolling mill and steel press departments of the Simmons Co., involving about 200 workers of the 2600 in the plant, ended on the same conditions that have prevailed in the past, according to Elmer W. Hanak, works manager. The men had asked for a 15 per cent wage increase.

Pay Raise Ends 3-Day Sloss-Sheffield Strike

Birmingham

• • • **A 3-day strike** of union mechanics and maintenance men at the by-products plant of Sloss-Sheffield Steel & Iron Co. here ended Jan. 30 with the approximately 150 employees receiving an average wage increase of about 3c. an hour.

Steel Industry Will Study Capacity Rise

Washington

• • • **Study of the possibility** of undertaking a gradual increase in the overall steel capacity as opposed to an immediate forced expansion was agreed upon at a conference William S. Knudsen, Director General of the Office of Production Management and members of his staff held last Friday with five steel executives representing approximately 70 per cent of the country's steel making capacity.

To this end, it was announced by Mr. Knudsen, the industry will appoint representatives of large and small companies to collaborate with the OPM in exploring the subject. It was agreed that the report on steel capacity now being prepared for the President by Gano Dunn will be taken as the basis for the study. It was stated that the OPM has acknowledged receipt of the plan of the Steel Worker's Organization Committee and will study the extent to which it can contribute to the general problem of producing more steel at once.

The steel executives told the OPM that the industry is seeking to achieve full utilization of existing facilities and asked the OPM's cooperation in the effort. In this connection it was stated that the industry is considering the advisability of shifting orders where this will result in an increase in the amount of steel available. Discussion of expanding facilities, if found necessary, is said to have dealt with all departments of the industry, blast furnace, steelmaking and finishing, and not merely with ingot capacity.

The committee informed the OPM that the steel industry is in the process of expanding its productive facilities, pointing out that total capacity increased from 81,619,000 net tons of ingots annually in January, 1940, to 84,152,000 tons by January, 1941, an addition of more than 2,500,000 tons. Expansion of capacity during 1941, the Knudsen announcement said, is expected to exceed that made during 1940.

The steel executives who conferred with the OPM were: Benjamin F. Fairless, president, United States Steel Corp.; E. G. Grace, president, Bethlehem Steel Corp.; E. L. Ryerson, chairman of the board, Inland Steel Co.; T. M. Girdler, chairman of the board, Republic Steel Corp.; and E. T. Weir, chairman of the board, National Steel Corp.

Coming Events

Feb. 7 to 8—Iron, Steel and Allied Industries, annual conference, Del Monte, Cal.

Feb. 12 to 13—Steel Founders' Society of America, annual meeting, Chicago.

March 4 to 5—American Society for Testing Materials, spring meeting, Washington, D. C.

March 12 to 14—Society of Automotive Engineers, national aeronautic meeting, Washington, D. C.

March 25 to 29—American Society of Tool Engineers, Machine and Tool Progress Exhibit, Detroit.

April 16 to 18—Electrochemical Society, Inc., spring meeting, Cleveland.

April 23 to 25—Concrete Reinforcing Steel Institute, annual meeting, Hot Springs, Va.

May 5 to 7—American Gear Manufacturers Association, annual convention, Hot Springs, Va.

May 12 to 15—American Foundrymen's Association, annual meeting, New York.

7800 Allis-Chalmers Workers Still Idle

Milwaukee

• • • **So far as production** is concerned the Allis-Chalmers plant has been closed since the CIO walkout on Jan. 22. Efforts of union and company officials together with federal conciliators have been fruitless. The strike affects about 7800 workers with 2800 office and maintenance employees still at work. The company has about $26,000,000 worth of defense or semi-defense orders in production and another approximating $14,000,000 on the boards. Besides a wage increase the union is demanding a closed shop which the company flatly refuses.

Steel Capacity in U. S. at New Peak

• • • **Steel producing capacity** of the nation has reached a new peak of 84,152,000 net tons of steel ingots and castings a year, according to the American Iron and Steel Institute's annual survey of the steel industry's productive capacity.

The present rated capacity of the steel industry represents a rise of more than 2,500,000 tons a year over the figure of 81,619,000 tons annually of Dec. 31, 1939, and is almost 40 per cent higher than the capacity of 61,021,000 tons of steel as reported at the close of 1918.

Compared with steel capacity in 1929 of 72,985,000 tons, the present figures show an advance of fully 15 per cent, or nearly twice as much as the percentage increase in the nation's population since 1929.

The rated capacity figures compiled and published by the institute are based on the actual operating experience of every steel making furnace in the industry. In the total rated capacity as reported, generous allowance has been made for time lost by the periodic shutdowns of furnaces for repairs, relining, etc. If necessary, the industry could produce up to 2.5 per cent more than its rated total, which would increase its maximum working capacity at the present time to as much as 86,250,000 tons.

Included in the net increase of approximately 2,500,000 tons of annual capacity during 1940 are the figures for new furnaces installed during the year, and the added capacity created by the modernization and enlargements of older furnaces. In addition, certain steel companies have brought back into service some steelmaking equipment, both open hearth furnaces and bessemer converters, which had been removed from the active list a year or so ago, but which had not been dismantled.

During 1940 the steel industry's annual capacity for producing ingots and castings by the open hearth process rose from 73,722,000 tons to 74,566,000 tons. Annual bessemer steel capacity rose from 6,010,000 tons at the close of 1939 to 6,997,000 tons at the end of 1940. Further additions to open hearth capacity to come into production later in 1941 have already been announced by several companies in the industry but are not included in the above figures.

Capacity for producing steel in electric furnaces rose from 1,883,000 tons as of Dec. 31, 1939, to 2,586,000 tons as of Dec. 31, 1940. Nearly all of that increase came from the construction of new furnaces ordered during 1940 and completed before the year end. Other new electric furnaces now under construction are expected to increase that total capacity still further during the first half of 1941.

The industry's capacity for producing crucible steel decreased during 1940 from 5400 tons annually to 3900 tons.

The following table compares the steel industry's total annual capacity, in net tons, for producing ingots and steel for castings for certain years from 1918 to date. In the figures for 1934 and subsequent years, the total capacity for producing ingots and steel for castings includes only that part of the capacity for castings of foundries operated by companies producing steel ingots.

Dec. 31	Ingots	Ingots and Steel for Castings
1918	58,630,000	61,021,000
1929	70,636,000	72,985,000
1934	78,103,000	78,452,000
1937	79,593,000	80,186,000
1938	81,238,000	81,829,000
1939	80,951,000	81,619,000
1940	83,581,000	84,152,000

STOP ALL WASTE: These posters, warning consumers to save to prevent industrial shortages, are typical of those now being used in Britain.

Photo by International

Detroit Marketers to Discuss New Products

Detroit

• • • **Problems facing** a manufacturer in the introduction of a new product will be discussed Feb. 10 before the Industrial Marketers of Detroit, chapter of the National Industrial Advertisers Association, by George M. Gregory, of Owens Corning Fiberglas Co. The meeting will follow luncheon at 12:15 p. m. at Hotel Statler in the Bagley room. W. Colburn Standish, president of the Adcraft Club of Detroit, will preside.

Industrial Advertisers

• • • **Toronto has been** chosen by the National Industrial Advertisers Association as the city in which its 19th annual conference, to take place in September, will be held, according to Richard P. Dodds, president of the association and advertising manager of Truscon Steel Co., Youngstown, Ohio.

Steel Industry Earnings Climb

Bethlehem Steel Co. and its subsidiaries reported for 1940 net income of $48,677,524 after all charges, compared with net of $24,638,384 in 1939. Fourth quarter profit last year was $14,516,779 compared with $12,462,288 in the third quarter. A dividend of $1.50 on common will be paid March 4 to shares of record Feb. 11.

E. G. Grace, president, reporting on various phases on the company's business, said that Bethlehem's record backlog contains $1,036,100,000 of ship orders and $168,000,000 in orders for steel products, with January steel orders exceeding shipments and 27.1 per cent of 1940 shipments going to export (two-thirds of this to England and Canada). Steel bookings at the start of 1941 totaled 2,229,000 net tons against 1,670,000 net tons at the start of 1940, he said.

Bethlehem employees, working 38.2 hr. in the fourth quarter of 1940 against 36.6 hr. in the third quarter, earned an hourly average of 96.9c. against 93.2c. The company has two years' supply of manganese ore and well over a year's supply of tin, Mr. Grace said. Its 1940 payrolls, $212,233,000 to 118,439 employees, compared with $158,490,000 to 95,029 employees in 1939. "We have no shortage of labor," Mr. Grace said.

The Bethlehem president said that he sees no need for steel priorities now, and that the steel industry will expand ingot capacity if defense makes this necessary.

Bethlehem's steel production in the fourth quarter (ingots and castings) averaged 103.5 per cent, as compared with 99 per cent in the previous quarter, and averaged 93.3 per cent for the entire year as compared with 70.8 per cent for 1939. The company's rated steel capacity has been increased from 11,468,800 net tons to 11,850,000 net tons a year. Current steel production is 100 per cent of capacity.

Inland Steel Co. earned $8.87 a common share in 1940, or a net profit of $14,450,385 for that year compared with a profit of $10,931,016 in 1939. Inland's profit in the fourth quarter of last year was $4,561,901 against $4,574,441 in the corresponding period of 1939.

Edward L. Ryerson, Inland chairman, said that: "Ingot production of 2,901,870 net tons for the year was at the rate of 93.8 per cent of theoretical capacity compared with 77.7 per cent for 1939. The rate for the fourth quarter was 106.7 per cent compared with 101.2 per cent in the third quarter, and 102.6 per cent in the fourth quarter of 1939.

"As of Jan. 1, 1941, Inland's annual theoretical capacity has been increased by 200,000 tons in order to bring it more nearly in line with actual experience under present operating conditions, even though no new furnaces were added during the year.

"Average number of employees for the last quarter of 1940 was 20,785, and for the year 1940 was 19,868, compared with 17,278 for the year 1939. Total payrolls for 1940 were approximately $36,000,000, and for 1939, $32,281,261.

"Inland's exports were 7.5 per cent of shipments for the full year and 9.9 per cent for the quarter. The company exported only 1.4 per cent of its output in 1939."

National Steel Corp. reports earnings of $6,271,187.08 for the fourth quarter of 1940, equal to $2.84 per share on 2,204,667 outstanding shares of capital stock, compared with earnings of $3,827,310.80 in the third quarter of 1940, which equaled $1.74 per share on 2,202,367 shares then outstanding.

For the year 1940, earnings amounted to $17,112,315.01, after all the usual charges, but before provision for excess profits tax, equal to $7.76 per share on 2,204,667 shares, compared with $12,581,635.69 earned in the year 1939, which amounted to $5.71 per share.

Excess profits tax for 1940 amounted to $2,045,974.43, or 93 cents per share, so that, after this provision, the net earnings for the year 1940 totaled $15,066,340.58, equivalent to $6.83 per share on 2,204,667 outstanding shares.

Wheeling Steel Corp. and subsidiary companies shows a net profit for 1940 of $5,663,930, after all charges (including a provision for federal income taxes of $1,625,000), as compared with net earnings for the year 1939 of $5,560,753. Wheeling's earnings for 1940, after providing for full dividends upon the two classes of preferred stock outstanding, are equivalent to $6.59 per share upon 569,349 shares of common stock outstanding at Dec. 31, 1940, as compared with $6.40 per share for the year 1939.

Wheeling directors declared the regular quarterly dividend of $1.25 per share payable April 1, 1941, upon the outstanding $5 cumulative convertible prior preferred stock and passed a resolution calling for the redemption on April 1, 1941, of all shares of the 6 per cent preferred stock which shall be outstanding on that date, at the redemption price of $133 per share, which price includes a dividend of $33 per share declared today representing all accruals to the redemption date.

Steel Pay Average Up To 86.5c. Hourly

• • • Approximately 585,000 employees were at work in the steel industry during the month, an increase of 8000 over the average of 577,000 reported for November. In December a year ago, 563,000 were employed.

Steel payrolls of $91,233,000 during December compared with $87,921,000 in November and with $84,537,000 in December, 1939, the American Iron and Steel Institute reports.

Wage-earning employees in the industry received an average of 86.5c. an hour in December against 86.2c. in November and 85.0c. in December, 1939. An average of 37.6 hr. per week was worked by wage earners in December, 38.2 hr. in November and 36.9 hr. in December, 1939.

Warner & Swasey Earns $3,371,283 in 1940

Cleveland

• • • Net earnings of Warner & Swasey Co. for 1940 after all deductions, including provision for estimated federal income and excess profits taxes, totaled $3,371,283 as compared with $1,864,553 for 1939. Earnings in 1940 were equivalent to $4.19 per share on the 803,135 shares outstanding as of Dec. 31, 1940.

Metallurgical Inspection Course Started at Chicago

Chicago

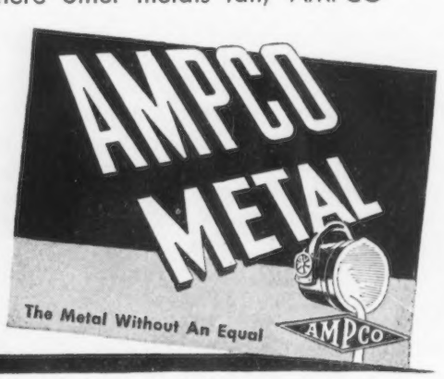
• • • **Chicago chapter of** American Society for Metals has instituted a course in metallurgical inspection for all government material inspectors. The course is free to members of Chicago and Calumet chapters, and non-members are required to pay a $5 fee. The nine lecture course started on Thursday, Jan. 30, with J. Walter Scott of the Western Electric Co. lecturing on "General Properties of Metals." The course is being conducted in the auditorium of the Peoples Gas Light & Coke Co., Chicago. R. G. Roshong is chairman, W. D. McMillan, program chairman, and E. A. Terwell, secretary.

SUCCESS STORY
Outwearing
ALL OTHERS 3 to 1
A manufacturer of bottle caps reports this experience: Guide pin bushings on machines for cutting out bottle caps must not show the slightest variation due to wear. AMPCO METAL, Grade 18, is now used for these bushings, and it's outwearing everything previously used 3 to 1.

. . . and that's how ONE Manufacturer Profits by the use of AMPCO METAL

How about you? Is "metal failure" causing trouble in any part of your product or production tools? AMPCO METAL — the service-proved aluminum bronze alloy — may be the answer. It's outstanding in its resistance to wear — its toughness and strength — its resistance to impact, stress, fatigue and corrosion. Where other metals fail, AMPCO very often succeeds. Isn't it worth trying? Explain your problem and our technical staff will work out recommendations. There's no obligation. Write —

AMPCO METAL, INC.
Dept. IR-2-6
Milwaukee, Wisconsin



Docks For 45,000 Ton War Ships To Be Built

• • • Two new shipbuilding drydocks, in which super-battleships of at least 45,000 tons can be built, will be constructed at the Brooklyn Navy Yard on land largely owned by New York City, Mayor LaGuardia has revealed. The docks will cost a minimum of $15,000,000 and are part of the Navy's total defense program. Surveys of the land are being made and Mayor LaGuardia was to discuss details with government officials this week.

Half Canada's Plants Have War Orders

Toronto

• • • **In a survey of** Canadian industry just completed by *Industrial Canada,* the official publication of the Canadian Manufacturers' Association, some interesting statistics were gathered. To a questionnaire sent out to all members of the association, more than half the firms replying stated they were working on war orders, one-third are working two shifts and 10 per cent three shifts.

During 1940 expenditures on plant expansions, new equipment and other improvements were undertaken by 62 per cent, while 31 per cent contemplate considerable expenditure on these accounts in 1941. Two-thirds of the companies increased employment last year on an average of 50 per cent. The majority reported skilled labor as very scarce, but no serious difficulty in obtaining ordinary help; 56 per cent found difficulty in obtaining raw materials and equipment and 62 per cent stated that Canadian business had increased.

Clark Equipment Plans $2,500,000 Expansion

Chicago

• • • **Clark Equipment Co.** will spend $2,500,000 in expanding facilities for the production of truck housings and transmissions for army trucks. Expansion will be completed and production underway in from seven to 10 months, according to a letter sent to stockholders by Eugene B. Clark, president.

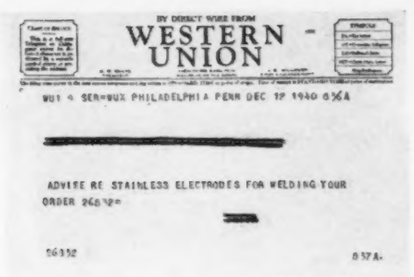
URGENT STOP IT HAS TO

BE RIGHT THE FIRST TIME

WELDING OF STAINLESS

STEELS STOP USE ARCOS

ASSURANCE


BY DIRECT WIRE FROM

WESTERN UNION

WU1 4 SERMBUX PHILADELPHIA PENN DEC 17 1940 6:57A

ADVISE RE STAINLESS ELECTRODES FOR WELDING YOUR ORDER 26612

56332 857A

Are you sure of your stainless welds? Are you as sure of them as you are of the base metal which you are welding?

The proper welding of stainless steel and special alloys often presents problems which are as exacting as they are unique. The correct electrode for any job must be capable of satisfying a wide range of requirements — physical, chemical, metallurgical, and practical. Weakness in any one of these factors effects the quality and efficiency of the weld metal deposited and the resultant service of the vessel.

We firmly believe that the answer to these basic welding problems is built into Arcos electrodes — twenty eight analyses in practically every size. The best way to play safe is to stick to Arcos on every stainless job. There is an Arcos distributor near you, or write —

ARCOS CORPORATION
Dept. A, 401 N. Broad St.
Philadelphia, Pa.

"QUALITY WELD METAL EASILY DEPOSITED"

JUST OFF THE PRESS!
ARCOS TECHNICAL BULLETIN NO. 4

DEPOSITION RATE GRAPH—estimate accurately quantity of electrodes needed, and welding time required. DATA on Cr. and Cr.-Ni. alloy weld metal; types of service for each grade, and recommended heat treatment. COMPLETE LIST of Arcos stainless electrodes and chemical analysis of weld metal obtained. CURRENT RANGE for each size of electrode shown on graph. An indispensable pocket size guide. *Write for your free copy today — or you may obtain Bulletin No. 4 from your distributor.*

Name Your Insulation Problem . . .

Carey CAN GIVE YOU THE ANSWER FOR TOP EFFICIENCY AND ECONOMY

Is Your Problem—

to cut fuel and power costs?

to manufacture more economically?

to modernize for greater efficiency?

to provide efficient air conditioning?

to insulate for below-zero temperatures?

to insulate for temperatures up to 2500°F.?

to facilitate the long distance transmission of steam by proper insulation of pipe lines?

● All these problems and scores of others are everyday routine with the CAREY organization. CAREY'S 67 years of experience in meeting industry's insulation requirements assures a practical, prompt and economical solution of YOUR insulation problems. You're always SAFE with CAREY.

WRITE TODAY FOR INSULATION CATALOG—ADDRESS DEPT. 26

●

INDUSTRIAL BUILDING AND MAINTENANCE PRODUCTS OF

ASPHALT—ASBESTOS—MAGNESIA

BUILT-UP AND PREPARED ASPHALT ROOFINGS
ROOF PAINTS, COATINGS, CEMENTS
HEAT INSULATIONS
ASBESTOS-CEMENT PRODUCTS
CORRUGATED SIDING & ROOFING
INDUSTRIAL FLOORING • BUILDING INSULATION
EXPANSION JOINTS • WATERPROOFING MATERIALS

THE PHILIP CAREY COMPANY • Lockland, Cincinnati, Ohio

Dependable Products Since 1873

IN CANADA: THE PHILIP CAREY COMPANY, LTD. Office and Factory: LENNOXVILLE, P. Q.

Defense Board Moves Into New Offices

Washington

• • • **The Office of** Production Management moved last week to new offices in the Social Security Board building between Third and Fourth streets, S.W., on Independence Avenue.

Director General William S. Knudsen; Sidney Hillman, Associate Director General; John D. Biggers, Director of the Division of Production; Donald M. Nelson, Director of the Division of Purchases; Edward R. Stettinius, Jr., Director of the Division of Priorities, and Robert W. Horton, Director of Information, all have offices on the fifth floor of the building. Stacy May, Director of Research and Statistics, and Frank Bane, Director of State and Local Cooperation, are also located in the new building.

Commissioners Davis, Agriculture; Elliott, Consumer Protection; Henderson, Price Stabilization, and Budd, Transportation, of the National Defense Advisory Commission, will remain in the Federal Reserve Board Building temporarily until new quarters are found.

H. H. Robertson Buys Central Tube Property

Pittsburgh

• • • **H. H. Robertson Co.**, makers of construction materials, has purchased part of the idle Central Tube Co. property at Ambridge, Pa. The company bought 23 acres from the National Supply Co. which purchased Central Tube several months ago. Robertson company officials stated that as yet no plans had been made for the use of the property.

18,000 Work on Powder Plant in Indiana

Jeffersonville, Ind.

• • • **Addition this week** of 3000 steam and pipe fitters to the payroll has raised total employment to more than 18,000 for the powder plant under construction here. Before the $74,000,000 project is finished in May, the payroll is expected to reach 20,000.

6 Magnesium Firms Receive Indictments

New York

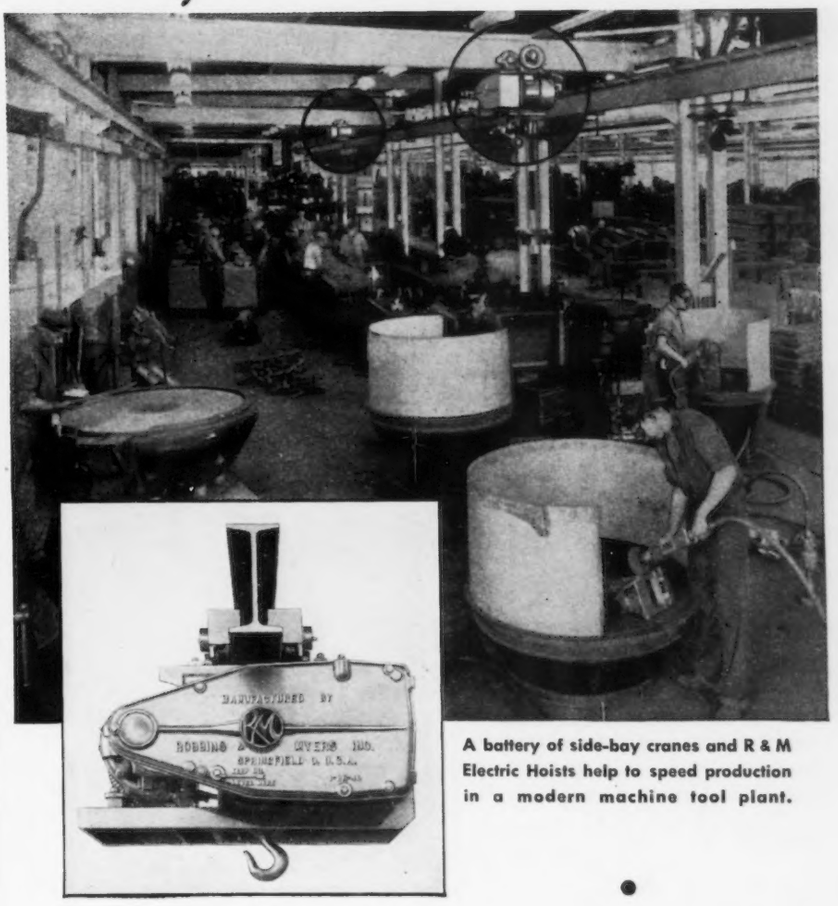
• • • **Indictments charging** six corporations in the magnesium industry with violations of the federal anti-trust laws were returned by a federal grand jury last week after the Department of Justice alleged that restrictions were "illegally imposed on the production of magnesium by a combination of American and German corporations."

The indictments charged that the production of magnesium has been retarded by a combination of four American firms, the Aluminum Co. of America, the American Magnesium Co., the Magnesium Development Co., and the Dow Chemical Co. Also named was the I. G. Farben Industry, which the Justice Department described as "the German Dye Trust." Nine individuals who are either officers or directors in the defendant companies were likewise named as defendants.

Results of the combination and alleged conspiracy to violate the anti-trust laws, the Justice Department charged, have been (1) inadequate facilities to produce magnesium on the scale needed for the defense program; (2) restrictions on the use of magnesium and its products in the manufacture of planes and other products; (3) a serious shortage of foundry facilities for fabrication, seriously impeding plane production; (4) the maintenance of artificially and unreasonably high magnesium prices, with sales abroad made at substantially lower prices; (5) and the maintenance of a single producer of magnesium in the United States.

Since 1939, the anti-trust division has been investigating restrictions on materials essential to national defense. Indictments already have been returned charging restrictions in such important military materials as optical instruments and tungsten carbide, extensively used in the machine tool industry. This inquiry, the department reported, has shown "startling evidence of German influence in domestic industries essential to national defense."

"Better call in R&M first!"



A battery of side-bay cranes and R & M Electric Hoists help to speed production in a modern machine tool plant.

THAT'S the wise counsel "grapevining" from plant to plant. When there's a puzzling hoist or crane problem to be solved, veteran plant engineers know that Robbins & Myers can often provide the quickest and most *profitable* answer.

And if none of the 2000 standard R & M Hoists fits your set-up, you'll get a special job, built and tailored to order for you, that *does*.

R & M Hoists crowd power, speed, nimbleness, and easy control into a minimum of headroom space. They are equipped with R & M's own famous motors . . . are completely built and assembled in one plant, shipped ready to operate.

If there's a way to save *you* time and money and speed your present production schedule, bank on R & M to find it. Phone your nearest Robbins & Myers branch office *now*. Or write the factory direct today for complete details on hoists adapted to your particular needs.

ROBBINS & MYERS, Inc.

HOIST & CRANE DIVISION • SPRINGFIELD, OHIO

Steel Capacity Is 84,152,000 Tons

• • • **Steel-producing** capacity of the nation has reached a new peak of 84,152,000 net tons of steel ingots and castings per year, according to the American Iron and Steel Institute's annual survey of the steel industry's productive capacity.

The present rated capacity of the steel industry represents a rise of more than 2,500,000 tons per year over the figure of 81,619,000 tons annual capacity rated as of Dec. 31, 1939, and is almost 40 per cent higher than the capacity of 61,021,000 tons of steel as reported at the close of 1918.

Compared with steel capacity in 1929 of 72,985,000 tons, the present figures show an advance of fully 15 per cent, or nearly twice as much as the percentage increase in the nation's population since 1929.

The rated capacity figures compiled and published by the Institute are based on the actual operating experience of every steelmaking furnace in the industry. In the total rated capacity as reported, generous allowance has been made for time lost by the periodic shutdowns of furnaces for repairs, relining, etc. If necessary, the industry could produce up to 2.5 per cent more than its rated capacity, which would increase its maximum working capacity at the present time to as much as 86,250,000 tons.

Included in the net increase of approximately 2,500,000 tons of annual capacity during 1940 are the capacity of new furnaces installed during the year, and the added capacity created by the modernization and enlargements of older furnaces. In addition, certain steel companies have brought back into service some steelmaking equipment, both open hearth furnaces and Bessemer converters, which had been removed from the active list a year or so ago but which had not been dismantled.

During 1940 the steel industry's annual capacity for producing ingots and castings by the open hearth process rose from 73,722,000 tons to 74,566,000 tons. Annual bessemer steel capacity rose from 6,010,000 tons at the close of 1939 to 6,997,000 tons at the end of 1940. Further additions to open hearth capacity to come into production later in 1941 have already been announced by several companies in the industry but are not included in the above figures.

Capacity for producing steel in electric furnaces rose from 1,883,000 tons as of Dec. 31, 1939, to 2,586,000 tons as of Dec. 31, 1940. Nearly all of that increase came from the construction of new furnaces ordered during 1940 and completed before the year-end. Other new electric furnaces now under construction are expected to increase that total capacity further during the first half of 1941.

The industry's capacity for producing crucible steel decreased during 1940 from 5,400 tons annually to 3,900 tons.

The following table compares the steel industry's total annual capacity, in net tons, for producing ingots and steel for castings for certain years from 1918 to date. In the figures for 1934 and subsequent years, the total capacity for producing ingots and steel for castings includes only capacity for castings of foundries operated by companies producing steel ingots.

As of Dec. 31.	Ingots	Ingots and Steel for Castings
1918	58,630,000	61,021,000
1929	70,636,000	72,985,000
1934	78,103,000	78,452,000
1937	79,593,000	80,186,000
1938	81,238,000	81,829,000
1939	80,951,000	81,619,000
1940	83,581,000	84,152,000

Stainless Electrode Plant Doubles Capacity

• • • **Arcos Corp.,** Philadelphia, announces an addition to its stainless electrode manufacturing plant which will give it approximately 100 per cent increase in capacity. The new units, in part operation since mid-January, will be completed by mid-February.

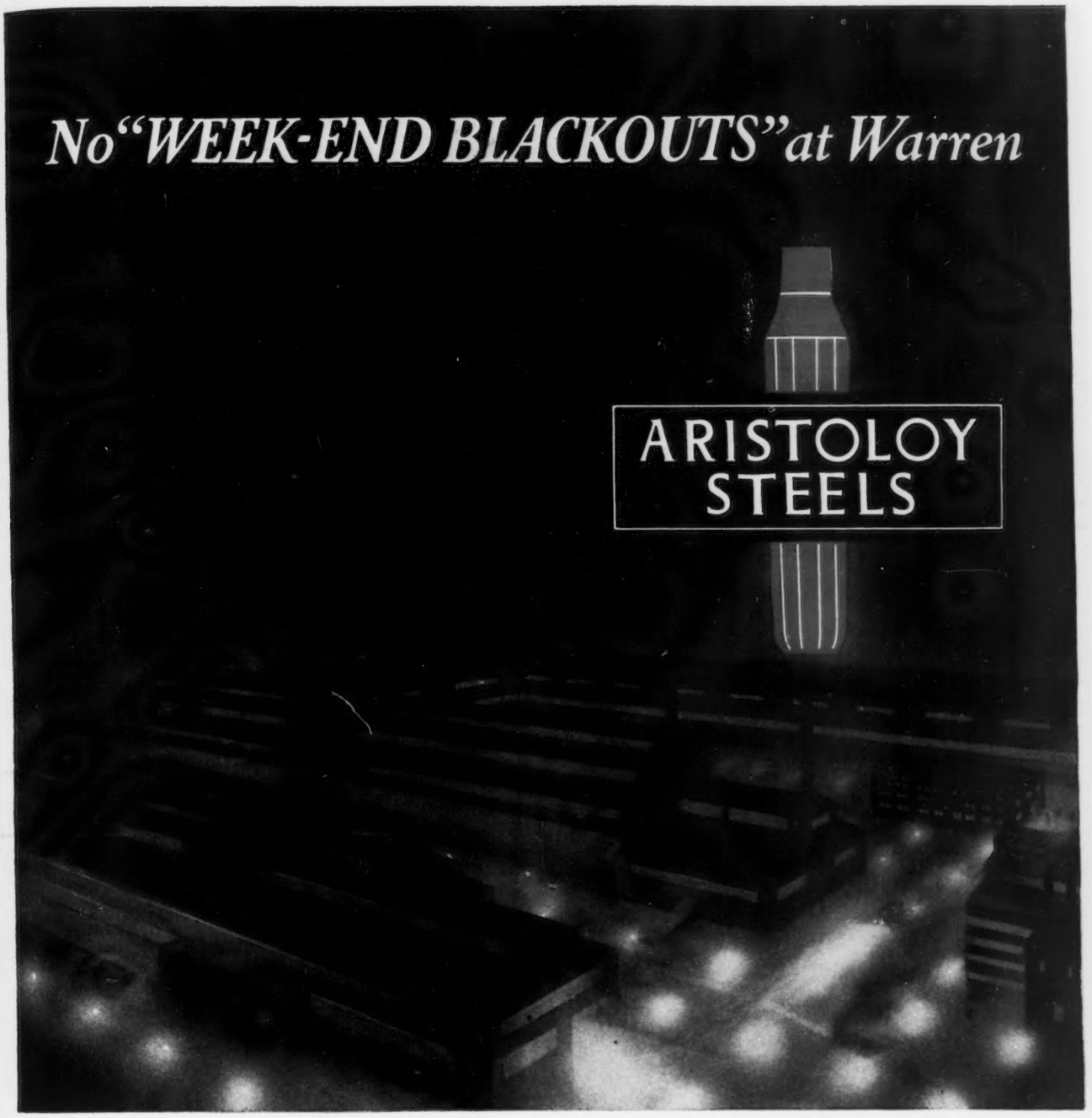
the practical side of Springmaking — BY DUNBAR

ask yourself these questions about your springs

Are we now using the proper spring material?
Are there too many . . . or too few coils?
Do our springs have a tendency to take a "set"?
Are we paying for operations that can be eliminated?
Should ends be ground . . . or would plain ends answer the purpose?
Why do we have to replace springs?
Are we paying for unnecessarily close tolerances?

ASK
Dunbar Bros. Co.
DIVISION OF ASSOCIATED SPRING CORPORATION
BRISTOL, CONNECTICUT
If you have any question about the performance of your springs, why not send your assembly here for a practical analysis

No "WEEK-END BLACKOUTS" at Warren



Conscious of our responsibility to our customers, and conscious of the importance of speed and quantity, as well as quality, we're doing our utmost to keep abreast of the demand for Aristoloy Steels by working twenty-four hours every day and seven days every week . . . and we are cheerfully adding new plant capacity just as fast as the necessary equipment can be obtained. There are no week-end blackouts at Warren—nor will there be any until the job is completed.

COPPERWELD STEEL CO., WARREN, OHIO

ARISTOLOY S.A.E. ALLOY BILLETS AND BARS; OXIDATION AND CORROSION RESISTING STEELS; TOOL AND SPECIAL STEELS; AIRCRAFT QUALITY STEELS; STAINLESS STEELS

Bankers, Others Inspect Republic Steel Plants

• • • **More than 65** representatives of banking, investment, and insurance firms from a dozen eastern cities made a two-day inspection tour of northern Ohio plants of Republic Steel Corp. last Thursday and Friday. The company expects to file a registration statement with the SEC early in February covering a refinancing program.

The tour started in Youngstown with inspection of Republic's steel plant and Truscon Steel Co., a Republic subsidiary. On Thursday afternoon a visit was paid to the Niles and Warren plants. On Thursday evening a dinner was given for the group in Cleveland.

On Friday an inspection trip was made of the Cleveland steel works, including the hot and cold strip mills, and in the afternoon the company's alloy operations in Massillon and Canton were visited.

THESE are the things it pays to check before you buy springs. Actually, they are all part of Accurate's code of operations—highest quality and accuracy of product, backed by real service. That's what you're looking for! Why not get it? Write Accurate today for your copy of the Accurate Handbook of Spring Data.

Accurate Springs

3819 West Lake Street Chicago, Ill.

ACCURATE SPRING MFG. CO.

Census Shows Outlay of Metalworking Industries

Washington

• • • **The first time** information of the kind has been gathered, Director of the Census William Lane Austin has released a report disclosing that 1939 capital expenditures of establishments accounting for 92.6 per cent of the value of products of the metal-working industries totaled $20,766,205.

The major portion of these expenditures represented purchases of new machinery valued at $16,055,755 or 77.3 per cent of the total. The cost of new construction was $3,713,168 or 17.9 per cent of the total, and of plant and equipment acquired in a "used" condition and land, $988,340 or 4.8 per cent of the total.

The three industries "Machine Tools," "Machine-Tool and other Metal-Working Machinery and Accessories, Metal-Cutting and Shaping Tools and Machinists' Precision Tools" and "Metal-Working Machinery and Equipment, Not Elsewhere Classified," were combined to make up the sub-group of industries called the metal-working industries.

Union Agrees to Work Overtime on Defense

Racine, Wis.

• • • **An A. F. of L.** carpenters' union local here has voted to accept a five-hour extension in their work week with no increase in pay "in the interest of national defense". At present the carpenters work 35 hr. weekly at the rate of $1.30 an hour. About 30 members of the local are on projects at Fort Sheridan and Camp Grant, Army posts, and at the Great Lakes Naval Training Station.

C-I Readies Clairton Works Blast Furnace

Pittsburgh

• • • **Carnegie-Illinois** Steel Corp. is rehabilitating its No. 3 blast furnace at the Clairton Works. Last operated in October, 1930, the furnace is expected to be in blast about May 1. Return of the Clairton furnace to the active list will make possible an additional annual pig iron production of 200,000 net tons.

Defense Course Started At Youngstown School

Youngtown

• • • **A program** at Youngstown College designed to help district plants in the national defense program started here Jan. 28 when 77 men enrolled in two of four courses.

The pupils were selected from principal plants in the district for instruction in materials testing and inspection or machine design. Harry J. Sweeney, metallurgist for Republic Steel Corp., is in charge of the testing course, while Henry A. Holberson, engineer for Youngstown Metal Products Co., is instructor of the machine design course. Two other courses will be added — engineering drawing and shop mathematics, to be under the direction of Leif Oyen of Youngstown Sheet & Tube Co., and production supervision, under the direction of Ralph Florek of Westinghouse Electric & Mfg. Co. at Sharon.

Inspection is very important in the defense program, Mr. Sweeney told his students. One flaw may mean a shell to explode in the gun or go off too soon to be effective.

Cold Metal to Increase Annealing Facilities

Youngtown

• • • **An important addition** to its annealing facilities will be made by Cold Metal Process Co. here in order to facilitate the rolling of strip steel. Three annealing furnaces have been built in the past six months, part of the added facilities being designed and built by the company itself. The plant is working three turns a day six days a week with some departments working seven days. Five Steckel mills are being built for customers ranging from 7½ to 26 in. wide.

New Freight Cars Used in 1940 More Than Double 1939

• • • **Class 1 railroads** in 1940 put 65,545 new freight cars in service, according to the Association of American Railroads. The past year's figure was an increase of 41,017 cars over 1939, and 47,028 more than 1938.

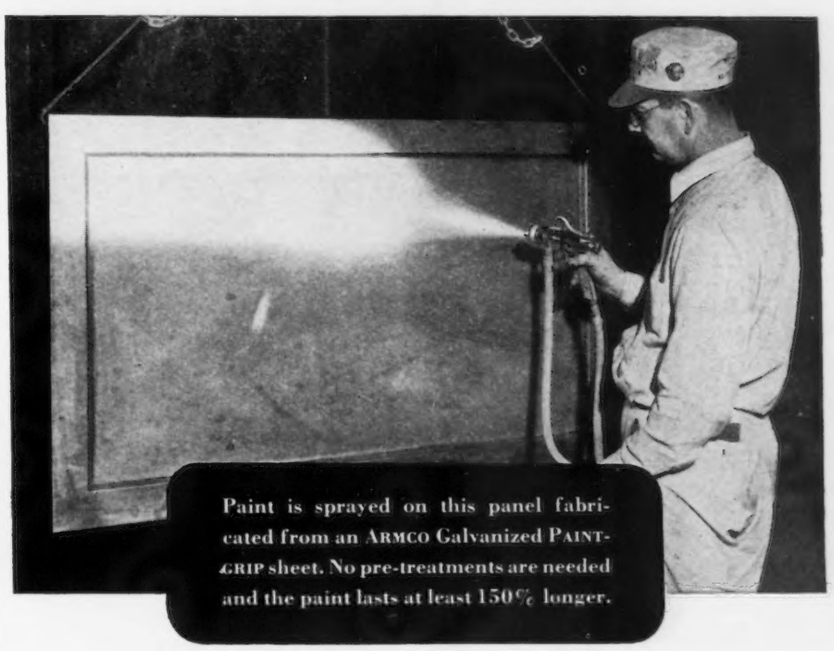
C-I Selling Part of Pencoyd Plant Property

• • • **Carnegie-Illinois** Steel Corp. is selling a portion of its Pencoyd plant property in the Philadelphia area to the Pencoyd Realty Co. of Philadelphia. Included in the sale are 19 acres on the west bank of the Schuylkill River, a bridge fabricating shop, and several small service buildings formerly used by the American Bridge Co.

No steel making facilities of Carnegie-Illinois at Pencoyd are involved in the sale. Some time ago a small portion of the Pencoyd plant was sold to the Empire Ordnance Co., which is working on national defense projects. It is believed that the current sale will result in the property described above being eventually transferred to Empire Ordnance.

Carnegie-Illinois will soon start production of steel at the Pencoyd open hearth furnaces as a national defense measure.

➡ A PROFIT ANGLE On Sheet Metal Products!



Paint is sprayed on this panel fabricated from an ARMCO Galvanized PAINTGRIP sheet. No pre-treatments are needed and the paint lasts at least 150% longer.

If you make sheet metal products to be painted (or that would be more salable painted), it may pay you to consider the manufacturing and selling advantages of ARMCO Galvanized PAINTGRIP sheets.

For example, would you be interested in making more durable galvanized metal products if you could paint them attractively *without "make-ready" costs?*

ARMCO Galvanized PAINTGRIP sheets will appeal to both your designers and production men. Briefly, it is a special bonderized galvanized sheet that *takes* and *preserves* paint. It needs no pre-treatment, and cuts painting time in half. Your products will have the definite protection of a good zinc coating and the extra protection and beauty of paint.

Just tell us what you make, or intend to make, and we'll be glad to send you a working sample of ARMCO PAINTGRIP for a trial. Write The American Rolling Mill Company, 680 Curtis St., Middletown, O.

ARMCO PAINTGRIP SHEETS

Government Awards

Government awards during the week ended Jan. 25, 1941, as listed by the Public Contracts Division, Department of Labor, follows:

Iron and Steel Products:

Aerial Machine & Tool Corp., New York; post assys. $53,400
Aetna Iron & Steel Co., Jacksonville, Fla.; doors 45,769
Air Conditioning & Refrigeration Supplies, Inc., Charleston, W. Va.; stand assy. 17,550
Alco Fabricating Corp., Pawtucket, R. I.; pipe-berth bottoms 11,900
American Bridge Co., Washington; structural steel 92,523
American Locomotive Co., Railway Steel Spring Div., New York; springs 21,501
Armstrong Bros. Tool Co., Chicago; wrenches 59,875
Autocar Co., Ardmore, Pa.; mounts 40,775
Banner Die Tool & Stamping Co., Columbus, Ohio; bomb shackles. 141,750
Barbour-Stockwell Co., Cambridge, Mass.; castings 11,000
Barnard Aviation Equip. Co., Ashley, Pa.; belt links 928,550
Belmont Iron Works, Philadelphia; structural steel 124,900
Bethlehem Steel Co., Bethlehem, Pa.; structural steel 124,350
Breeze Corp., Inc., Newark, N. J.; flexible conduits 49,672
J. G. Brill Co., Philadelphia; pack howitzer 189,627
J. G. Brill Co., Philadelphia; carriage parts 80,973
Capital Steel & Iron Co., Oklahoma City, Okla.; structural steel 154,585
Carpenter Steel Co., Reading, Pa.; steel 19,906
Central Steel Tube Co., Clinton, Iowa; tripod mts. 302,315
Chicago Metal Hose Corp., Maywood, Ill.; flexible conduits 46,769
Cleveland Welding Co., Cleveland; casing burster 484,330
Consolidated Steel Corp., Ltd., Los Angeles; structural steel 146,098
Continental Can Co., Inc., New York; gas masks 174,832
Crane Co., Salt Lake City, Utah; pipe, fittings 10,064
Crane Co., Washington; valves .. 16,479
Crown Cork & Seal Co., Inc., Baltimore, Md.; gun mounts 1,147,030
James Cunningham Sons & Co., Rochester, N. Y.; carriage assys. 1,993,620
J. Cunningham Sons, Rochester, N. Y.; carriage assys. 294,600
Cuyahoga Spring Co., Cleveland; tent slips 10,875
Draper Mfg. Co., Cleveland; discs, tools, gages 27,146
Estate Stove Co., Hamilton, Ohio; range parts 13,710
Evans Products Co., Detroit; tripod mts. 1,278,440
Firestone Tire & Rubber Co., Akron, Ohio; canisters 125,942
Firestone Tire & Rubber Co., Akron, Ohio; band tracks 17,500
Firestone Tire & Rubber Co., Akron, Ohio; belt links 3,986,340
Firth-Sterling Steel Corp., McKeesport, Pa.; tools 35,880
Charles Fischer Spring Co., Brooklyn; sears 24,185
Michael Flynn Mfg. Co., Philadelphia; doors 59,828
General Bronze Corp., Chicago; doors 65,273
General Bronze Corp., Long Island City, N. Y.; platform assys. ... 102,405
General Bronze Corp., Long Island City, N. Y.; bus housings 13,210
General Steel Castings Corp., Eddystone, Pa.; cast steel hull ... 37,500
Globe Machine & Stamping Co., Cleveland; cartridge cases 859,250
Gohmann Foundry Co., Inc., New Albany, Ind.; range parts 19,432
Goodman Mfg. Co., Chicago; yokes 591,500
B. F. Goodrich Co., Akron, Ohio; band tracks 7,189,539
Louis Hanssen's Sons, Davenport, Iowa; saws 22,344
Hardware Supply Corp., New York; wrenches 12,704
Herring - Hall - Marvin Safe Co., Hamilton, Ohio; safes 16,593
Hobart Mfg. Co., Troy, Ohio; telescope mts. 61,377
Igoe Brothers, Inc., Newark, N. J.; rein. bars 13,700
International Harvester Co., Chicago; springs 16,580
Jackes-Evans Mfg. Co., St. Louis; belt links 783,000
J. B. Klein Iron Foundry Co., Oklahoma City, Okla.; structural steel 47,743
Lamson Co., Syracuse, N. Y.; mounts 441,000
Lukens Steel Co., Coatesville, Pa.; structural steel 10,249
McCord Radiator & Mfg. Co., Detroit; helmet assys. 958,584
McEvoy Co., Houston, Texas; mounts 759,780
McKay Co., Pittsburgh; releases.. 28,584
Mills-Morris Co., Washington; wire cutters 77,480
H. C. Moore, an individual trading as Moore Eastwood & Co., Dayton, Ohio; post assys. 58,500
Mosher Steel Co., Houston, Texas; structural steel 76,699
Edward Moskowitz, Inc., Brooklyn; aiming posts 16,632
Mullins Mfg. Corp., Salem, Ohio; cartridge cases 5,076,325
Nashville Bridge Co., Bessemer, Ala.; structural steel 21,212
National Cash Register Co., Dayton, Ohio; fuze shell 769,919
Noland Co., Inc., Washington; saws 23,535
Oliver Iron & Steel Corp., Pittsburgh; fuse plugs 118,125
Parker Wire Goods Co., Worcester, Mass.; bits 18,134
Peck, Stow & Wilcox Co., Southington, Conn.; wrenches 47,118
Pettibone Mulliken Corp., Chicago; carriage parts 3,817,884
Republic Steel Corp., Massillon, Ohio; structural steel 10,310
W. S. Rockwell, New York; furnace 29,034
Rundle Mfg. Co., Camden, N. J.; sink and tray 44,088
Joseph T. Ryerson & Son, Inc., Chicago; steel tubing 196,368
Sands Mfg. Co., Cleveland, Ohio; heaters 54,467
Wm. Scrimgeour, Washington; basting spoons 37,350
Sheet Metal Specialty Co., Follansbee, W. Va.; stove pipe 15,207
Southern Engineering Co., Charlotte, N. C.; structural steel ... 43,819
Spreisch Tool & Mfg. Co., Inc., Buffalo, N. Y.; bomb shackle .. 335,920

For **BETTER WIRE**

Copper-coat with CUPRODINE

CUPRODINE creates a denser, tighter, brighter and more uniform coating, in less time. Provides better lubrication for drawing than ordinary copper coating.

Pickle with RODINE

RODINE, added to the pickling bath, saves acid and metal, minimizes brittleness, and lowers pickling costs. Standard the world around.

CHEMICALS ACP PROCESSES

For complete information write

AMERICAN CHEMICAL PAINT CO.
Main Office & Works AMBLER, PENNA.

NATIONAL DEFENSE PROGRAMS

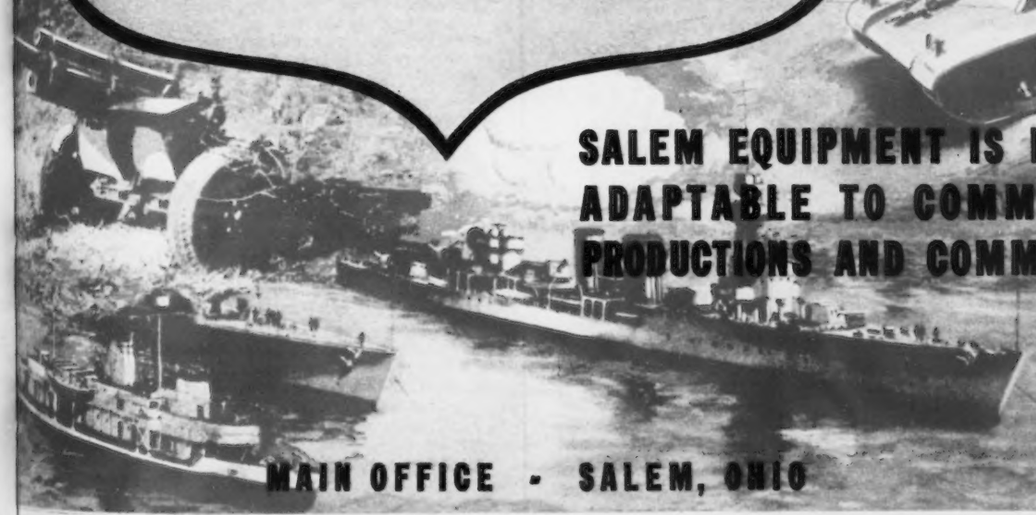
Call for high speed productions and accurate methods

SALEM processes and equipment are meeting these requirements . . .

CONSULT SALEM'S ORDNANCE DEPARTMENT

FOR

WITTER PROCESS FOR FORGING SHELLS
SHELL HEAT TREATING PLANTS
COMPLETE CARTRIDGE CASE PLANTS
GUN PLANTS
ARMOR PLATE CARBURIZING EQUIPMENT



SALEM EQUIPMENT IS READILY ADAPTABLE TO COMMERCIAL PRODUCTIONS AND COMMODITIES

MAIN OFFICE - SALEM, OHIO

SALEM ENGINEERING COMPANY

Star Foundry Co., Covington, Ky.; range parts 20,169
Star Machine & Tool Co., Minneapolis; brake reliners 35,100
Steel Conversion & Supply Co., Castle Shannon, Pa.; chisels ... 22,680
Steel & Wire Products Co., Baltimore, Md.; steel strapping 15,816
Threadwell Tap & Die Co., Greenfield, Mass.; taps 12,263
Trackson Co., Milwaukee; gun mounts 100,791
Truscon Steel Co., Jacksonville, Fla.; rein. steel 12,126
Truscon Steel Co., Youngstown, Ohio; doors 52,851
Union Parts Mfg. Co., Inc., Brooklyn; burster casings 18,118
Union Spring & Mfg. Co., New Kensington, Pa.; springs 15,876
U. S. Automatic Corp., Amherst, Ohio; adapter-booster 53,388
United States Steel Export Co., Washington; steel piling 11,699
Universal Crusher Co., Cedar Rapids, Iowa; cradle assys. 802,410
Valley Iron Works, Inc., Yakima, Wash.; trashracks 30,614
Vollrath Co., Sheboygan, Wis.; kitchen utensils 29,445
Walworth Co., New York; wrenches 55,288
Wheeling Corrugating Co., Wheeling, W. Va.; gas. containers .. 436,180
John Wood Mfg. Co., Inc., Conshohocken, Pa.; range boilers 55,548
Yale & Towne Mfg. Co., Stamford, Conn.; padlocks 17,250
Youngstown Pressed Steel Div. of Mullins Mfg. Corp., Warren, Ohio; sink and tray 836,992
Youngstown Sheet & Tube Co., Youngstown, Ohio; steel plate.. 21,555

Air Corps:

Allith-Prouty, Inc., Danville, Ill.; stand assemblies $88,750
American Gas Accumulator Co., Elizabeth, N. J.; lamp assemblies 255,420
Biederman Motors Corp., Cincinnati; truck-tractors 346,080
Blackhawk Manufacturing Co., Milwaukee; jack assemblies, airplane 264,225
Chandler-Evans Corp., South Meriden, Conn.; assemblies 101,250
Chandler-Hill Corp., Detroit; assemblies 45,000
Folmer-Graflex Corp., Rochester, N. Y.; cameras, ground 72,953
General Electric Co., Schenectady, N. Y.; generator assemblies ... 31,980
Jaeger Watch Co., Inc., New York; tachometer assemblies .. 30,669
Walter Kidde & Co., New York; cylinder assemblies, oxygen 139,535
Minneapolis Honeywell Regulator Company, Philadelphia; floodlight flare stand assemblies 25,971
Parker Appliance Co., Cleveland, Ohio; benders stands 31,590
Pioneer Instrument Div., Bendix Aviation Corp., Bendix, N. J.; compass assemblies 213,520
Pump Engineering Service Corp., Cleveland, Ohio; pumps 34,969
Variety Aircraft Corp., Dayton, Ohio; stand assemblies 198,000

Corps of Engineers:

Aetna Iron & Steel Co., Jacksonville, Fla.; hangar doors $45,769
American Bridge Co., Gary, Ind.; steel hangars 92,523
American Bridge Co., Gary, Ind.; steel hangars 25,164
American Type Founders Sales Corp., Mt. Vernon, N. Y.; rotary presses 37,757
Belmont Iron Works, Eddystone, Pa.; steel hangars 124,900
Bender Body Co., Elyria, Ohio; tilt-type trailers 279,788
Bethlehem Steel Co., Pittsburgh; steel hangars 124,350
Capital Steel & Iron Co., Oklahoma City, Okla.; hangar doors 154,585
Chicago Bridge & Iron Co., Chicago; water tank 28,850
Consolidated Steel Corp., Maywood, Cal.; hangar doors 282,991
Davenport Besler Corp., Davenport, Iowa.; locomotives 178,325
Ditto, Inc., Chicago; machine, duplicating gelatine process ... 96,831
Electric Wheel Co., Quincy, Ill.; pole-type trailers 166,200
Fate-Root-Heath Co., Plymouth, Ohio; locomotives 125,250
Michael Flynn Mfg. Co., Philadelphia; hangar doors 59,828
General Bronze Co., Chicago; hangar doors 65,273
General Electric Co., Erie, Pa.; locomotives 398,700
J. B. Klein Iron Fdry. Co., Oklahoma City, Okla.; steel hangars 47,743
Mid-West Locomotive Works, Hamilton, Ohio; locomotives 35,000
Mosher Steel Co., Houston, Tex.; steel hangars 103,199
D. W. Onan & Sons, Minneapolis, Minn.; generator sets 237,700

The surface of COLORBOND, the new galvanized sheet by Newport, provides a natural "tooth" that tightly holds paint, enamel, lacquer, and similar finishes, which will not adhere to an untreated galvanized surface.

In manufacture, COLORBOND is subjected to chemical and metallurgical processes that change the surface without in any way weakening the protective spelter coating. The galvanizing remains intact, unimpaired, a durable protection that safeguards the metal even after the paint coating has disappeared. Further, when COLORBOND Galvanized Sheets are used, the value and life of any surface treatment is actually increased.

Easily fabricated and formed without special tools, COLORBOND is ideal for highway signs, truck bodies, radiator covers, grilles, meter boxes, air ducts, building materials and innumerable other products where a finishing coat is desirable or necessary.

COLORBOND is available in steel, copper bearing steel, and GOHI Pure Iron-Copper Alloy, in a full range of sizes and gauges. Literature and complete information furnished on request.

THE NEWPORT ROLLING MILL CO.
NEWPORT KENTUCKY
DIVISION OF THE ANDREWS STEEL CO.

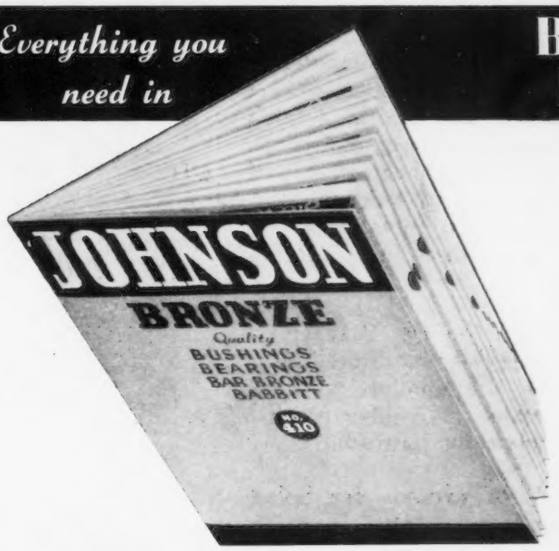
NEWPORT PRODUCTS: Hot Rolled Sheets • Electrical Sheets • GOHI Pure Iron-Copper Alloy • Globe Brand Galvanized Steel Sheets, Roofing and Siding • GOHI Enameling Iron Sheets • KCB Copper Steel Sheets • Newport Long Terne Sheets • Newport Galvannealed and DeLuxe Metal Sheets.

D. W. Onan & Sons, Minneapolis, Minn.; generator sets 86,038
A. G. Rushlight & Co., Portland, Ore.; plumbing, heating and sheet metal 257,500
Southern Engineering Co., Charlotte, N. C.; steel hangars 43,819
Trailer Co. of America, Cincinnati, Ohio; semi-trailers 497,880
Tuscon Steel Co., Youngstown, Ohio; hangar doors 52,861
Vulcan Iron Works, Wilkes-Barre, Pa.; locomotives 48,750

Navy Department:

Allegheny Ludlum Steel Corp., Breckenridge, Pa.; steel, C-R welding $145,740
Alpha Metal & Rolling Mills, Inc., Brooklyn, N. Y.; rings, seal for waterproof protecting cap assemblies 5,600
American Metal Co., Ltd., New York; copper, ingot 142,780
American Smelting & Refining Co., New York; copper, ingot 122,854
Anaconda Wire & Cable Co., New York; cable, electric 13,635
Art Metal Construction Co., Washington; tables, drafting .. 7,417
Bethlehem Steel Co., Bethlehem, Pa.; steel, C-R bar 7,203
Bristol Yacht Building Co., So. Bristol, Maine; 2 sweepers, mine 300,000
Browne & Sharpe Mfg. Co., Providence, R. I.; grinders, tool ... 13,083
California Steel Products Co., San Francisco; buoys, peg top 149,546
Caswell, Strauss & Co., Inc., New York; tin, pig, grade A 536,149
Cincinnati Shaper Co., Cincinnati; machines, shear, squaring 17,583
Circle Wire & Cable Corp., Maspeth, L. I., N. Y.; cable, single conductor, triplex 19,482
Collyer Insulated Wire Co., Pawtucket, R. I.; cable, electric .. 9,615
Columbia Steel Co., Washington, D. C.; nails, wire steel 6,611
Consolidated Machine Tool Corp., Rochester, N. Y.; mill, boring and turning 184,704
Crane Co., Washington, D. C.; valves, bronze 6,781
Crucible Steel Co. of America, New York; steel, C-R bar grade 25,923
M. T. Davidson Co., Brooklyn, N. Y.; pumps, reciprocating evaporator, oil cooler, fuel oil and air and vacuum 66,289
Eastern Rolling Mill Co., Baltimore; steel, C-R welding 24,825
Electro Metallurgical Sales Corp., New York; ferromanganese 13,141
Frick Co., Inc., Waynesboro, Pa.; equipment, refrigerating 16,149
Fyr-Fyter Co., Dayton, Ohio; extinguishers, fire 9,577
General Electric Co., Schenectady, N. Y.; generators, motor 59,082
General Electric Co., Schenectady, N. Y.; insulation, coil material. 28,652
General Motors Corp., Cleveland Diesel Engine Division, Cleveland, Ohio; engine, auxiliary 11,083
Gisholt Machine Co., Madison, Wis.; lathe, turret 6,368
Gisholt Machine Co., Madison, Wis.; lathes, turret 18,143
Gould & Eberhardt, Newark, N. J.; shapers, crank 11,594
Gould & Eberhardt, Newark, N. J.; shapers, universal 14,262
Hardinge Bros., Inc., Elmira, N. Y.; lathes, precision 7,505
Hardinge Bros., Inc., Elmira, N. Y.; machines, milling 21,279
Harrisburg Steel Corp., Harrisburg, Pa.; cylinders, gas 55,032
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio; press, hydraulic.. 17,005
International Minerals & Metals Corp., New York; zinc, slab (spelter) 34,128
Jessop Steel Co., Washington, Pa.; steel, C-R bar 25,009
Keystone Steel & Wire Co., Peoria, Ill.; nails, wire, steel 21,468
Kollsman Instrument Division of Square D Co., Elmhurst, N. Y.; tubes, pitot static 63,000
Kuhlman Electric Co., Detroit Elec. Furnace Div., Bay City, Mich.; furnace, elec. arc 8,650
Lionel Corp., New York; binnacles and domes 30,005
Lionel Corp., New York; compasses, ship 16,250
Mattison Machine Works, Rockford, Ill.; molder, electric 6,143
Metals Refining Co., Div. of The Glidden Co., Hammond, Ind.; cuprous oxide 66,750
Michigan Tool Co., Detroit; units, worm gear 436,680
Moeller Instrument Co., Inc., Richmond Hill, N. Y.; thermometers, industrial 41,899
National Tube Co., Washington, D. C.; flasks, steel 75,862
Norton Co., Worcester, Mass.; grinders, universal 19,902
Okura & Co., New York; miller, planer type 52,510

Everything you need in **BEARING BRONZE**



NEW from COVER to COVER

Contents

GENERAL PURPOSE BRONZE BEARINGS
UNIVERSAL BRONZE BARS
ELECTRIC MOTOR BEARINGS
GRAPHITED BRONZE BEARINGS
FLANGED BEARINGS
BABBITT
APPLICATION DATA

Here it is . . . right off the press . . . Johnson Bronze General Catalogue No. 410. Between its two covers you will find, listed and described, the most complete stock bronze bearing service in the world. Many new sizes have been added . . . many new types . . . more valuable bearing data. A copy has been reserved for you. Simply clip the attached coupon and mail it TODAY.

JOHNSON BRONZE COMPANY
Sleeve Bearing Headquarters
505 S. MILL ST. · NEW CASTLE, PA.

Clip and Mail—Today

JOHNSON BRONZE CO., 505 S. Mill St., New Castle, Pa.
Please forward without obligation a copy of Catalogue 410.

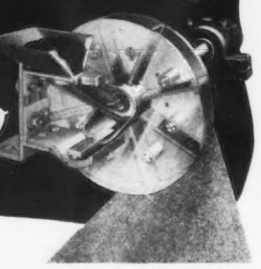
Name ..... *Position* .....

Firm .....

Street Address ..... *City* ..... *State* .....

THE WHEELABRATOR METAL CLEANING and FINISHING PROCESS

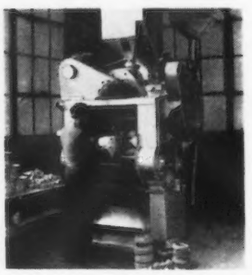
What it is and what it will do



The WHEELABRATOR is an airless mechanical unit that utilizes controlled centrifugal force for abrasive blasting. It is used for cleaning and finishing such products as castings, forgings, stampings, heat-treated products, steel sheet, strip, and the like, prior to machining, welding, plating, enameling, galvanizing, metalizing, lacquering, painting and other finish coating processes.

The Airless WHEELABRATOR Abrasive Blasting Unit. Abrasive is fed to the center of the Wheel after which the Wheel takes control and accelerates and directs the abrasive upon the work.

The type of work being WHEELABRATED is practically unlimited — it ranges in size from the smallest washers and springs to bathtubs, cylinder blocks, and heavy armor plate for battleships.



A 20" x 27" Tumblast Cleaning Brass and Iron at Florence Pipe Foundry and Machine Co.

New adaptions of the process are being discovered practically every day. Some of the more recent applications include: removing burrs and fins from machined parts, stampings and die castings; graining photo-lithographic plates; preparing the surfaces of mill rolls for producing the desired finish on steel sheets; cleaning rubber printing rolls prior to vulcanizing.

Cleaning Gray Iron Castings on a No. 1 Tablast at the Fremont Foundry Co., Fremont, Ohio

WHEELABRATOR equipment is built in a wide range of standard sizes for every requirement, and for shops ranging from the very smallest to the largest. Since 1933 (when we invented and introduced the process) more than a thousand plants have installed WHEELABRATORS. One shop has as many as 64 machines in operation and 114 others have from 2 to 5.

A WHEELABRATOR Special Cabinet designed for Cleaning Axle Shafts, Camshafts, etc.

It will pay you to investigate this modern cost-reducing, speed-cleaning process. And we will be glad to arrange for a test-demonstration on your products whenever you are ready. In the meantime write for complete information.

AMERICAN FOUNDRY EQUIPMENT CO.

510 S. Byrkit St. Mishawaka, Indiana

Oliver Instrument Co., Adrian, Mich.; grinders, drill	6,228
Phelps Dodge Copper Products Corp., Habirshaw Cable & Wire Div., New York; cable, electric	26,440
Phelps Dodge Copper Products Corp., Habirshaw Cable & Wire Div., New York; cable, triple conductor	50,151
Reed-Prentice Corp., Worcester, Mass.; lathes, engine	11,450
Republic Steel Corp., Massillon, Ohio; steel C-R grade	5,088
Revere Copper & Brass, Inc., Baltimore Div., Baltimore; brass, naval rolled	114,681
Rockford Machine Tool Co., Rockford, Ill.; machines, slotter and keyseater	18,328
Russell Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.; bolts and nuts, brass	179,309
Schauer Machine Co., Cincinnati; lathes, speed	26,401
A. O. Smith Corp., Milwaukee; flasks, torpedo, air	6,000
Smith-Courtney Co., Richmond, Va.; drills, radial	9,194
Sperry Gyroscope Co., Inc., Brooklyn, N. Y.; equipments, gyro compass	88,686
Taylor, Lowenstein & Co., Mobile, Ala.; rosin, lump	11,056
Weinman Pump Mfg. Co., Columbus, Ohio; pumps, centrifugal	93,255
Yale & Towne Mfg. Co., Philadelphia Div., Philadelphia; crane, truck	6,414
Yates - American Machine Co., Beloit, Wis.; molder, electric	22,974
Yates - American Machine Co., Beloit, Wis.; molder, electric	18,716
York Ice Machinery Corp., Philadelphia; units, refrigerating	85,932

Ordnance Department:

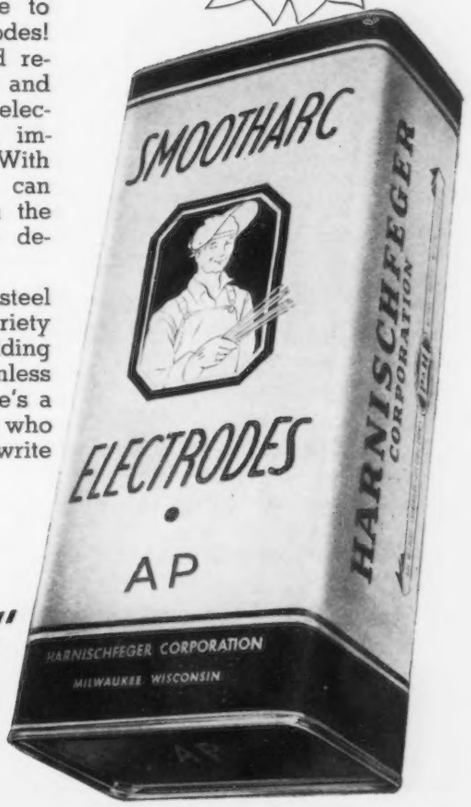
Adirondack Foundries & Steel Co., Watervliet, N. Y.; castings, steel	81,268
American Brake Shoe & Casting Co., New York; castings	9,477
American Brass Co., Waterbury, Conn.; cartridge brass	48,360
American Locomotive Co., Schenectady, N. Y.; forgings	35,090
American Locomotive Co., Railway Steel Spring Div., New York; springs	21,591
American Locomotive Co., Railway Steel Spring Div., New York; artillery materiel	3,795
American Steel & Wire Co. of New Jersey, Philadelphia; springs, firing pin	3,600
Anchor Post Fence Co., Baltimore, Md.; small arms materiel	9,157
Apex Tool & Cutter Co., Inc., Shelton, Conn.; cutters, milling	1,100
Associated Spring Corp., Wallace Barnes Co., Div., Bristol, Conn.; springs	1,304
Baird Machine Co., Bridgeport, Conn.; machines	20,205
Baldwin Locomotive Works, Philadelphia; bearings	1,408
W. F. & John Barnes Co., Rockford, Ill.; machines, drilling	23,591
Barwood & Co., Philadelphia; gages	2,479
Bausch & Lomb Optical Co., Rochester, N. Y.; instruments	10,993
Bearings Co. of America, Lancaster, Pa.; ball bearings	3,658
Bendix Aviation Corp., Eclipse Machine Div., Elmira, N. Y.; artillery ammunition components	38,100
Bendix Aviation Corp., Scintilla Magneto Div., Sidney, N. Y.; magnetos	2,535
Bennel Machine Co., Brooklyn, N. Y.; machinery	1,045
G. C. Blakeslee & Co., Cicero, Ill.; machines	16,560
Borg Warner Corp., Rockford Drilling Machine Co. Div., Rockford,	

Ill.; assemblies, flywheel, fan and hub 165,474
Boston Gear Works, Inc., Springfield, Mass.; reducers, gear 1,830
Boyt Harness Co., Des Moines, Iowa; gun covers 120,810
Bridgeport Thermostat Co., Inc., Bridgeport, Conn.; small arms materiel 3,682
Brown Brockmeyer Co., Inc., Dayton, Ohio; motors 1,065
Brown & Sharpe Mfg. Co., Providence, R. I.; gages 4,969
Brown & Sharpe Mfg. Co., Providence, R. I.; machines 3,972
Buda Company, Harvey, Ill.; tools 5,093
Budd Wheel Co., Detroit; disks .. 4,684
Budd Wheel Co., Detroit, Mich.; assemblies, wheel 12,828
Canister Co., Phillipsburg, N. J.; machines 14,260
Caterpillar Tractor Co., Peoria, Ill.; tractors 19,482
Chase Brass & Copper Co., Inc., Waterbury, Conn.; brass 95,353
Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati, Ohio; arbors, milling machine.. 2,694
Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati, Ohio; grinders 2,765
Circular Tool Co., Inc., Providence, R. I.; cutters 2,073
City Steel Door Corp., New York; chests, steel 2,488
Clark Equipment Co., Clark Tructractor Div., Battle Creek, Mich.; trucks, shop 2,292
Colt's Patent Fire Arms Co., Hartford, Conn.; pistols 41,962
Commerce Pattern Foundry & Machine Co., Detroit, Mich.; castings, bronze 15,750
Continental Motors Corp., Muskegon, Mich.; tools 1,376
Crawford Mfg. Co., Kansas City, Mo.; covers, spare barrel 22,353
Cuyahoga Spring Co., Cleveland, Ohio; small arms materiel 4,832
C. R. Daniels, Inc., New York; small arms materiel 1,556
DeLisser Machine & Tool Corp., New York; gages 3,000
Denison Engineering Co., Columbus, Ohio; presses 180,525
Detroit Broach Co., Inc., Detroit; broach sections 1,463
Detroit Broach Co., Inc., Detroit; broaching fixtures 2,285
Die Casters, Inc., Ridgefield, N. J.; die castings 4,925
Henry Disston & Sons, Tacony, Philadelphia; armor plates, experimental 3,168
Doehler Die Casting Co., Pottstown, Pa.; artillery ammunition components 1,915
Duff Norton Mfg. Co., Pittsburgh, Pa.; jacks, gear 10,442
Exact Weight Scale Co., Columbus, Ohio; scales 206,584
Fox Munitions Corp., Philadelphia; gages 14,290
General Machinery Corp., Boston, Mass.; machines, milling 3,717
Globe Forge & Foundry Co., Syracuse, N. Y.; forgings 2,614
Greenfield Tap & Die Corp., Greenfield, Mass.; gages 51,557
Greenfield Tap & Die Corp., Greenfield, Mass.; countersinks 2,480
Hanson Van Winkle Munning Co., Matawan, N. J.; sets, equipment, chrome plating 3,085
Hanson-Van Winkle-Munning Co., Matawan, N. J.; generators ... 1,626
Hanson-Whitney Machine Co., Hartford, Conn.; gages, thread 10,326
Hanson-Whitney Machine Co., Hartford, Conn.; gages 21,006
Louis Hanssen's Sons, Davenport, Iowa; saws 22,344
W. F. Hebard & Co., Chicago; tractors, industrial 1,083

AT A TIME LIKE THIS:

— when production calls for speed . . . you don't have to stop to test welding electrodes! Assure yourself of proved results, speed up your work, and cut your costs with P&H electrodes — approved by all important testing bodies. With simple procedures, you can quickly and easily obtain the exact physical properties desired in your welds.

Besides all standard mild steel types, P&H offers a wide variety of coated electrodes for welding high and low alloys, stainless steel, tool steels, etc. There's a P&H representative nearby who will gladly advise you. Or write us for information.



KEPT "Oven Dry" IN AIR-TIGHT CONTAINERS

P&H WELDING ELECTRODES

Ask about the new P&H-Hansen Square-Frame Welders. With simple, parallel hook-up they meet all high and low amperage needs. Bulletin W-28.

General Offices: 4401 W. National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER CORPORATION

WELDING ELECTRODES • MOTORS • HOISTS P&H ELECTRIC CRANES • ARC WELDERS • EXCAVATORS

Standard is equipped to supply steel castings of unusual size and shape to suit your requirements.

The acid open hearth steel is produced in Standard's furnaces under the control of trained metallurgists.

Standard's long experience and expert personnel is reflected in the high quality of its products.

CASTINGS • FORGINGS • WELDLESS RINGS • WROUGHT STEEL WHEELS

BLW THE BALDWIN GROUP

STANDARD STEEL WORKS

Division of THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA

Other Members of the Baldwin Group • THE BALDWIN LOCOMOTIVE WORKS
BALDWIN SOUTHWARK DIVISION • THE PELTON WATER WHEEL COMPANY
BALDWIN DE LA VERGNE SALES CORP. • THE WHITCOMB LOCOMOTIVE COMPANY
THE MIDVALE COMPANY • CRAMP BRASS AND IRON FOUNDRIES DIVISION

R. Hoe & Co., Inc., New York; artillery materiel 30,990
Holo-Krome Screw Corp., Hartford, Conn.; small arms materiel 3,619
Hydraulic Press Mfg. Co., Mt. Gilead, Ohio; presses, hydraulic 27,990
International Harvester Co., Chicago; tractors 3,770
International Harvester Co., Chicago; springs 16,580
John P. Kelly, Philadelphia; castings, bronze 10,500
Keuffel & Esser Co., Hoboken, N. J.; fire control equipment 2,720
Killeen Machine Co., Worcester, Mass.; inspection gages 1,063
H. R. Krueger & Co., Detroit; machines, drilling and tapping. 5,570
Laminated Shim Co., Inc., Glenbrook, Conn.; shims, brass laminated 1,468
A. B. Landis Sons, Inc., Philadelphia; dies 1,818
Lees-Bradner Co., Cleveland; machines, thread milling 39,458
Lincoln Park Tool & Gage Co., Lincoln Park, Mich.; gages 9,639
Lite Mfg. Co., New York; small arms materiel 9,495
Logansport Machine, Inc., Logansport, Ind.; presses 250,830
Lukens Steel Co., Coatesville, Pa.; steel rings 32,120
Lynd Farquhar Co., Boston, Mass.; presses, drill 5,333
McKiernan-Terry Corp., Dover, N. J.; machines, staking 128,846
W. L. Maxson Corp., New York; tools 14,000
Mercury Mfg. Co., Chicago; trucks, electric, shop 3,896
Mercury Mfg. Co., Chicago; trailers 5,856
Merriman Brothers, Inc., Boston; bushings 6,870
Mines Equipment Co., St. Louis; fire control equipment 1,610
Miller Mfg. Co., Inc., Richmond, Va.; chests, hand tool 14,172
Monarch Machine Tool Co., Sidney, Ohio; lathes 16,584
Modern Tool & Die Co., Philadelphia; gages 86,476
National Broach & Machine Co., Detroit; circular broaches 1,350
National Cash Register Co., Dayton, Ohio; artillery ammunition components 119,948
National Tool Co., Cleveland; countersinks 1,500
Noble & Westbrook Mfg. Co., East Hartford, Conn.; machines, marking 2,220
Norman-Hoffman Bearings Corp., Stamford, Conn.; ball bearings. 1,144
Norton Co., Worcester, Mass.; grinders, surface 8,445
Otis Elevator Co., Buffalo, N. Y.; castings, steel 7,582
Peters Engineering Co., Philadelphia; machines, case trim 4,000
Frank L. Phillips Co., Binghamton, N. Y.; castings, aluminum alloy 6,430
Poor & Co., Canton Forge and Axle Division, Canton; forgings 5,913
Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford, Conn.; gages 4,340
Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford, Conn.; gages, thread 40,610
Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford, Conn.; drills 2,250
Precision Mfg. Co., Philadelphia; gages 51,086
Precision Mfg. Co., Philadelphia; tools 5,289
Precise Tool & Mfg. Co., Farmington, Mich.; gages 48,211
Proctor & Schwartz, Inc., Philadelphia; dryers, automatic 1,520
Putnam Tool Co., Detroit; cutting tools 1,282

AWARDS

Read Machinery Co., Inc., York, Pa.; preheaters 74,227
Republic Steel Corp., Cleveland, Ohio; small arms material 140,149
Reska Spline Products Co., Detroit; thread gages 1,175
Reska Spline Products Co., Detroit; gages 24,050
Revere Copper & Brass Co., Baltimore Division, Baltimore, Md.; brass 167,976
Ringel Brothers, Newark, N. J.; artillery ammunition components 10,770
R. M. Mfg. Co., Royal Oak, Mich.; cartridge cases 16,081
Rudolph & West Co., Washington; drills 3,739
Schiller Nolan & Co., Inc., Philadelphia, Pa.; artillery material. 2,719
Schlosser Mfg. Co., Philadelphia; gages 50,174
Schwitzer-Cummins Co., Indianapolis, Ind.; cases, cartridge 357,875
Sheffield Gage Corp., Dayton, Ohio; gages, thread 1,701
Sheffield Gage Corp., Dayton, Ohio; machine tools 125,000
Sheffield Gage Corp., Dayton, Ohio; gages 3,924
Sipp-Eastwood Corp., Paterson, N. J.; machines, drilling 24,375
S. K. F. Industries, Inc., Philadelphia; roller bearings 1,369
Somerville Machine & Foundry Co., Somerville, Mass.; castings, bronze 20,481
Standard Machinery Co., Providence, R. I.; bearings 141,120
Standard Pressed Steel Co., Jenkintown, Pa.; small arms ammunition 563,599
W. M. Steele Co., Worcester, Mass.; equipment, sanding machine ... 2,441
Stevens-Walden, Inc., Worcester; chests, tool 2,429
Taft-Peirce Mfg. Co., Woonsocket, R. I.; gages 4,181
Taylor Winfield Corp., Warren, Ohio; welders 5,540
Timken-Detroit Axle Co., Detroit; artillery material 120,131
Timken Roller Bearing Co., Canton, Ohio; roller bearings 8,406
Thurston Mfg. Co., Providence, R. I.; cutters 6,500
Trackson Co., Milwaukee; small arms material 100,791
Tri-Metal Products Corp., Conshohocken, Pa.; castings, bronze .. 2,444
Tubular Service Corp., Pittsburgh; steel tubes 10,754
Union Twist Drill Co., Athol, Mass.; reamers 2,680
Union Twist Drill Co., Chicago; drills 2,007
Union Twist Drill Co., Athol, Mass.; hobs 5,454
United Precision Products, Size Control Co., Div., Chicago; gages, thread 1,433
United Shoe Machinery Corp., Boston; dies 2,187
Veit & Young, Philadelphia; punch blanks 1,440
Vinco Tool Co., Detroit; gages .. 3,668
Wadell Engineering Co., Newark, N. J.; tools 4,831
Stevens Walden, Inc., Worcester, Mass.; small arms material ... 2,160
Walker Mfg. Co., Racine, Wis.; jacks 1,522
Warner Electric Brake Mfg. Co., Beloit, Wis.; artillery material. 2,794
Watson-Stillman Co., Roselle, N. J.; pumps, hydraulic 6,450
Watson-Stillman Co., Roselle, N. J.; presses 363,075
Whitney Chain & Mfg. Co., Hartford, Conn.; assemblies, chain .. 2,699
Wiedemann Machine Co., Philadelphia; gages 6,994
Wright Aeronautical Corp., Paterson, N. J.; tools 1,918
Yale & Towne Mfg. Co., Chicago; trucks, elevating 26,812

Kennametal Steel Cutting Tools Speed R.A.F. Engine Production

Cylinder liners, cylinder barrels, retractor tubes, shafts, propeller hubs, gun tube shafts, gear blanks, and other parts of airplane motors and rigging are of hard alloy steel, often heat treated to as hard as 405 Brinell to obtain high physical properties. Steel-cutting carbide tools, tipped with a new tool composition containing the non-cratering ingredient $WTiC_2$, marketed in the United States, Canada, Great Britain and the rest of the world under the trade name "Kennametal," are widely used in this work.

At a famous aircraft engine works in England, for example, Kennametal is being used with outstanding success to machine steel cylinder liners for their engines. Required production on this work was 80 liners per shift, using two complete sets of tools for a battery of three Bullard Multi Matic Machines. Other carbide tools had failed to maintain this production after a lengthy demonstration, while the Kennametal tools proved their ability to maintain required production after a trial period of only one week. On the rough boring operation alone, Kennametal averaged 50 pieces per tool grind as compared to 15 pieces for other carbide tools, with a time cycle of 6 minutes as compared to 10 minutes when the other tools were used.

Kennametal tools are also used on Bullard Automatics for machining cylinder sleeves for another airplane engine manufacturer in England. Boring was done at 250 ft. per min., and .018" feed by the first two tools. For facing the shoulder end they had previously used high speed steel tools at 52 ft. per min., as it was an interrupted cut. By taking a regular turning tool (Kennametal style 11T50) and one of the opposite hand (Kennametal style 12T50) and grinding them with 3° negative Back Rake and 2° negative Side Rake, the speed was increased to 140 ft. per min. with .015" feed. Interrupted cutting on steel is customarily done with these tools employing slightly negative rake angles, giving long tool life.

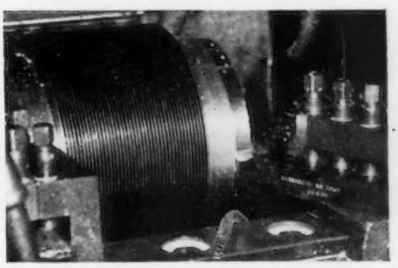
Kennametal turning tool with chip breaker on tip.

In addition to their extensive use in England for machining aircraft parts, Kennametal is also finding wide use in American airplane factories. Wright Aeronautical Corp., for example, turn Nitralloy steel cylinder barrels of 230-240 Brinell hardness at a speed of 200 ft. per min., with Kennametal tools. In another plant, the outside diameter of retractor tubes of SAE 4130 heat-treated to 40-42 Rockwell "C" are turned at 160 ft. per min. and 500 pieces per tool grind—resulting in a 400% increase in production.

While Kennametal steel-cutting tools are doing much to speed defense production, both in the United States and in England, they are also being used extensively to machine steel parts for ordinary commercial products. Because they will approximately double production on most steel cutting jobs, they are doing much to maintain the American standard of living while the country is arming for defense.

Kennametal tools and blanks are manufactured by the McKenna Metals Company, 144 Lloyd Ave., Latrobe, Pa., to whom all inquiries should be addressed. They are sold in Great Britain and the British possessions by George H. Alexander Machinery, Ltd., 82 Coleshill St., Birmingham, England; in Canada by Kennametal Tools and Mfg. Co., 24 Dunbar Ave., Hamilton, Ontario; and throughout the rest of the world by U. S. Steel Export Co., 30 Church St., New York, N. Y.

—Advertisement.



Kennametal tool machining Nitralloy steel cylinder barrel (230 Brinell) at 200 ft. per min. at Wright Aeronautical Corp., Paterson, N. J.

Yale & Towne Mfg. Co., Philadelphia; trucks, electric shop 4,258

Quartermaster Corps:

Aluminum Co. of America, Alcoa, Tenn.; aluminum ingots .....$ 2,436
Aluminum Co. of America, Massena, N. Y.; aluminum alloy bars 3,544
Aluminum Co. of America, New Kensington, Pa.; aluminum alloy 8,259
American Brass Co., Waterbury, Conn.; brass 892,063
Diamond Truck Motor Car Co., Chicago; trucks, telephone line construction 18,270
Federal Motor Co., Detroit; tractor-trucks 908,428
Fruehauf Trailer Co., Detroit; semi-trailers 9,956
General Motors Corp., Detroit; trucks 623
International Harvester Co., Inc., Chicago; trucks 668,546
Jakobson Shipyard, Inc., Oyster Bay, N. Y.; single screw diesel driven utility vessel 59,675
LaCrosse Trailer & Equipment Co., LaCrosse, Wis.; semi-trailers .. 2,930
Ward LaFrance Truck Corp., Elmira Heights, N. Y.; tractor-trucks 6,980
Mack Manufacturing Corp., Long Island City, N. Y.; tractor trucks 869,140
Marietta Mfg. Co., Point Pleasant, W. Va.; all steel, steam, twin screw riveted and welded Army Mine Planters 8,241,750
Pacific Fence Co., Los Angeles; fence 17,387
Reo Motors, Inc., Lansing, Mich.; trucks 4,600
Shwayder Bros., Inc., Detroit; lockers, trunk, metal 87,069
F. O. Stolte Company, Pacific Grove, Calif.; incinerator at Camp McQuaide, Calif. 10,450
Vanguard Construction Corp., New York; ordnance shop & boiler house at Ft. Story, Va. 50,795
Watson Automotive Equipment Co., Washington; semi-trailers 10,277
Yellow Truck & Coach Motor Co., Pontiac, Mich.; tractor-trucks.. 19,744

Signal Corps:

Alden Products Co., Brocton, Mass.; keys 38,334
American Lava Corp., Chattanooga, Tenn.; aircraft parts 11,141
L. S. Branch Mfg. Co., Newark, N. J.; keys 28,152
Allen D. Cardwell Mfg. Corp., Brooklyn, N. Y.; telegraph sets. 8,788
Continental Elec. Co., Inc., Newark, N. J.; generators & spare parts 58,275
H. M. Cornelius Co., New York; tool sets 23,404
Crannell, Nugent & Kranzer, Inc., New York; connectors 11,615
Dicke Tool Co., Downers Grove, Ill.; reel units 146,646
Dictaphone Corp., New York; code transmitters & recorders 8,625
Fred Ehrick, Inc., Brooklyn, N. Y.; panels 10,806
Federal Telegraph Co., Newark, N. J.; transmitting equipment for radio sets 59,531
Froiland Mfg. Co., Springfield, Mass.; control units and coupling 10,866
General Cable Corp., New York; wire 245,044
Graton & Knight Co., Worcester, Mass.; belts 10,692
Kellogg Switchboard & Supply Co., Chicago; microphones 493,000
Leich Electric Co., Genoa, Ill.; cabinet rectifiers 12,634
Wm. J. Murdock Co., Chelsea, Mass.; headsets 36,408
Parish Pressed Steel Co., Reading, Pa.; reels 8,140
Peter A. Petroff, New York; axles 14,008
Phelps Dodge Copper Products Corp., Habirshaw Cable & Wire Division, New York; wire 202,605
Remler Company, Ltd., San Francisco; connectors 11,328
J. M. Stone, Receiver, Operadio Mfg. Co., St. Charles, Ill.; parts for interphone equipment 26,186
Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.; parts for telephone 85,644
Taylor Tubes, Inc., Chicago; tubes 53,199
Technical Appliance Corp., New York; antennas 35,132
Technical Appliance Corp. New York; guys 35,271
Universal Microphone Co., Ltd., Inglewood, Calif.; microphones ... 122,000
Western Electric Co., Inc, New York; microphones 231,000
W. S. Wilson Corp., New York; wrench sets 12,211

Transportation Equipment:

Anthony Company, Streator, Ill.; platforms 27,956
Autocar Company, Ardmore, Pa.; half track 9,581,406

Three Generations of Wire Drawing Experience Offer You Round and Shaped Wire for Manufacturing Purposes

Steel Wire

Aircraft Wire
Armature Binding Wire
Bicycle Spoke Wire
Bobby Pin Wire
Bookbinder Wire
Bronze Plated Wire
Brush Wire
Car Seal Wire
Card Wire
Casing Wire
Curtain Spring Wire
Flat Wire
Flexible Shaft Wire
Fish Leader Wire
Hard Drawn Spring Wire
Half Round Wire
Hose Reinforcement Wire
Lock Spring Wire
Music Wire
Rope Wire
Scratch Brush Wire
Shaped Wire
Signal Corps Wire
Spoke Wire
Spring Wire
Tire Bead Wire
Tempered Wire
Valve Spring Wire

JOHNSON STEEL & WIRE CO., INC.

MAIN OFFICE AND PLANT • WORCESTER, MASSACHUSETTS

Branch Plants and Warehouses: AKRON, OHIO; LOS ANGELES, CALIF.

GOVERNMENT AWARDS

Autocar Co., Washington; trucks. 36,630
Basalt Rock Company, Inc., Napa, Calif.; barges 1,800,000
Biederman Motors Corp., Cincinnati, Ohio; truck-tractors 346,080
Consolidated Shipbuilding Corp., New York; sub. chasers 2,825,000
Dravo Corp., Pittsburgh; hull & fittings 3,447,000
Fruehauf Trailer Co., Detroit; trailers 58,374
General Motors Corp. (Chev. Div.), Detroit; trucks 10,094
General Motors Corp. (Chev. Div.), Detroit; trucks 14,792
Goodyear Tire & Rubber Co., Inc., Akron, Ohio; wheel assys. 1,531,331
Grumann Aircraft Engineering Corp., Long Island, N. Y.; airplanes 250,070
Pump Engineering Service Corp., Cleveland, Ohio; pump assys. ... 37,800
Steuart Motor Co., Washington; automobiles 24,144
Studebaker Corp, South Bend, Ind.; engines 33,657,580

Electrical Apparatus and Supplies:

American District Telegraph Co., New York; fire alarm sys. 13,065
James G. Biddle Co., Philadelphia; generators 11,419
Cook Electric Co., Chicago; switchboard 41,455
Gamewell Co., Newton Upper Falls, Mass.; signaling equip. 22,197
General Cable Corp., Washington; cable 44,543
General Electric Co., Knoxville, Tenn.; metering outfits 19,350
General Electric Co., Schenectady, N. Y.; dynamometers 40,520
General Electric Supply Co., Washington; elec. ranges 13,296
Graybar Electric Co., Knoxville, Tenn.; transformers 21,836
Graybar Elec. Company, Inc., New York; cable & reels 100,670
Graybar Electric Co., Inc., Washington; shackles, clips 48,919
Jackson Elec. Instrument Co., Dayton, Ohio; test oscillator 24,366
Midso Mfg. & Distributing Co., Inc., Sheboygan, Wis.; gas. generator 17,500
Nichols Elec. Co., Dayton, Ohio; fuses & links 37,691
D. W. Onan & Sons, Minneapolis, Minn.; generator set 86,038
D. W. Onan & Sons, Minneapolis, Minn.; generator set 237,700
Remler Co., Ltd., San Francisco; plugs 67,033
Hunt Spiller Mfg. Corp., Boston, Mass.; generator pts. 17,672
Stubbs Electric Co., Portland, Ore.; wire & cable 54,281
R. E. Uptegraff Mfg. Co., Scottdale, Pa.; transformers 16,254
Warner Elec. Brake Mfg. Co., Beloit, Wis.; brake equip. 28,240
Westinghouse Elec. & Mfg. Co., Portland, Ore.; telephone equip. 44,725
Weston Elec. Instrument Corp., Newark, N. J.; voltammeter 52,552
Westinghouse Elec. & Mfg. Co., Knoxville, Tenn.; equip. for turbo 18,393

Other Machinery:

Acme Machine Tool Co., Cincinnati, Ohio; lathes .....$ 23,616
American Laundry Machine Co., New York; laundry equip. 18,248
American Type Foundries, Elizabeth, N. J.; recoil mech. 570,380
G. R. Armstrong Mfrs. Supplies, Inc., Boston, Mass.; gear jacks. 10,442
Barnebey-Cheney Eng. Co., Columbus, Ohio; whetlerite plants .. 145,940
Bates Mfg. Co., New York; perforators for paper 12,405
Bay City Shovels, Inc., Bay City, Mich.; crane 11,712
Berger Engineering Works, Inc., Seattle; hoists 10,180
E. C. Brown Co., Rochester, N. Y.; spraying device 253,902
Brown & Sharpe Mfg. Co., Providence, R. I.; grinder 20,152
Buffalo Forge Co., Buffalo, N. Y.; shears 12,192
Busch Sulzer Brothers, Diesel Eng. Co., St. Louis; cylinder heads .. 40,463
Caterpillar Tractor Co., Peoria, Ill.; winches, bulldozers 62,232
Caterpillar Tractor Co., Peoria, Ill.; tractors 19,482
Cincinnati Milling Machine & Concinnati Grinders, Inc., Cincinnati, Ohio; milling machines 31,929
Continental Motors Corp., Muskegon, Mich.; engine parts 740,747
Clearing Machine Corp., Chicago; presses 27,700
Charles E. Crofoot Gear Corp., South Easton, Mass.; gears 14,490
Davenport-Besler Corp., Davenport, Iowa; locomotive 149,225
Ditto, Inc., Washington; duplicating mach. 96,851
Duriron Co., Inc., Dayton, Ohio; centrifugal pumps 12,512
Thomas A. Edison, Inc., Ediphone Div., West Orange, N. J.; shaving mach. 15,200

WIRE PRODUCTS
WIRE ROPE

FABRICATED STEEL
TRACK WORK

30
CHURCH
STREET

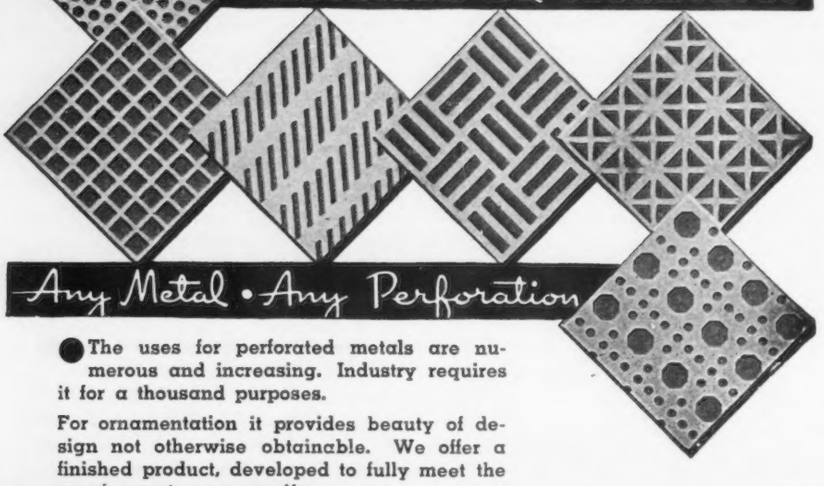
NEW
YORK
U.S.A.

TIN PLATE
STEEL SPECIALTIES

TUBULAR GOODS
ELECTRICAL WIRES

PERFORATED METAL

INDUSTRIAL and ORNAMENTAL



Any Metal • Any Perforation

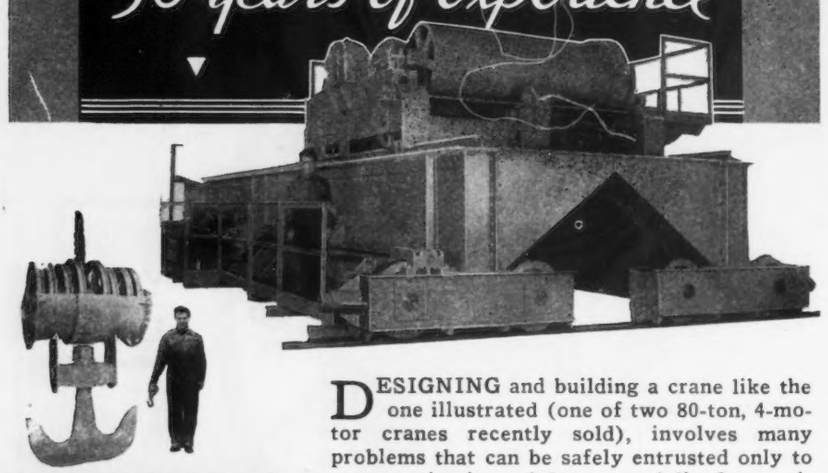
● The uses for perforated metals are numerous and increasing. Industry requires it for a thousand purposes.

For ornamentation it provides beauty of design not otherwise obtainable. We offer a finished product, developed to fully meet the requirements you specify.

The Harrington & King PERFORATING Co.

5657 FILLMORE STREET—CHICAGO, ILL.
New York Office, 114 Liberty Street

80 TONS of CAPACITY REFLECTING 30 years of experience



DESIGNING and building a crane like the one illustrated (one of two 80-ton, 4-motor cranes recently sold), involves many problems that can be safely entrusted only to an organization of long specialized experience and training.

Euclid's experience in crane design covers a third of a century, and we believe justifies your complete confidence.

Ask for catalog and tell us your crane problem. We will work with you.

EUCLID CRANES & HOISTS

THE EUCLID CRANE & HOIST CO.
1361 Chardon Rd., Euclid, Ohio

Canada To Set Up War Priorities Board

• • • Canada will establish a war priorities board to keep war plants up to production schedules. With large British orders for Canadian firms to be made public soon, it is stated the new board will cooperate with the War Time Requirements Board in speeding up deliveries most urgently needed by Britain. It will have powers to decide what orders being handled by Canadian firms are to be given precedence over others. Where a company has domestic orders on hand, the proposed new board will have authority to rule production be held up until war contracts have been fulfilled.

Fate-Root-Heath Co., Plymouth, Ohio; locomotive	125,250
General Elec. Co., Schenectady, N. Y.; locomotive	398,700
General Engineering & Dry Dock Co., San Francisco; winches	40,736
Thomas B. Gibbs & Co., Kelavin, Wis.; regulating equip.	354,832
Gisholt Machine Co., Madison, Wis.; lathes	60,851
C. H. Gosiger Mach. Co., Dayton, Ohio; drill presses	141,500
Hamilton Tractor & Equip Co., Chattanooga, Tenn.; tractors	18,184
Hendey Machine Co., Torrington, Conn.; lathes	32,223
Hydraulic Press Mfg. Co., Mount Gilead, Ohio; hydraulic press	27,990
Industrial Brownhoist Corp., Bay City, Mich.; crane	25,950
International Harvester Co., Chicago; tractors	523,581
E. A. Kinsey Co., Cincinnati, Ohio; drill presses	88,369
Mid-West Locomotive Works, Div. of Ceramic Mach. Co., Hamilton, Ohio; locomotive	35,000
Midwest Piping & Supply Co., Inc., St. Louis; flanging mach.	16,547
Norge Div. Borg-Warner Corp., Detroit; refrigerators	12,580
Northill Co., Inc., Glendale, Cal.; shear	15,281
Northwest Engineering Co., Chicago; cranes	22,216
Pratt & Whitney Div., Niles-Bement - Pond Co., Hartford, Conn.; lathes	20,676
Prosperity Co., Inc., Syracuse, N. Y.; laundry presses	18,776
"Quick-Way" Truck Shovel Co., Denver, Colo.; power shovel	10,971
Rockford Drilling Mach., Div. of Borg-Warner Corp., Rockford, Ill.; fan and hub assys.	165,474
St. Joe Machine, Inc., St. Joseph, Mich.; washing mach.	11,022
W. E. Shipley Mach. Co., Philadelphia; vertical mills	50,434
Spicer Mfg. Co., Toledo, Ohio; transmission	35,000
Tucker Aircraft Co., Detroit; traversing mech.	22,750
Tungsten Elec. Corp., Union City, N. J.; turning tools	22,840
Vulcan Iron Works, Wilkes-Barre, Pa.; locomotive	48,750
Warner & Swasey Co., Cleveland; lathes	46,418
Worthington Pump & Machine Corp., Harrison, N. J.; centrifugal pumps	14,495

Illinois Defense Plants Must Pay Job Insurance

Chicago

• • • **National defense** work does not exempt Illinois employers from payments to unemployment insurance, according to Martin P. Durkin, state director of labor. Work done on government property on government contracts does not make a contractor a federal instrumentality and therefore exempt from the state's unemployment compensation law. Durkin stated that the commissioner of internal revenue has ruled that the term "instrumentality" refers only to such agencies as are used by the government as instruments through which it exercises some governmental power.

Need of Total Security Cited by Wilson, of G-E

• • • **A long-term plan** for "arm-in-arm" cooperation between private business and government through four stages including the period of rearmament for defense and afterwards was outlined Jan. 29 by Charles E. Wilson, president of the General Electric Co., at the midwinter convention of the American Institute of Electrical Engineers in Philadelphia.

Mr. Wilson emphasized the need for "total security," moral, physical, and economic, to protect the democratic process and system of free enterprise against "destructive forces flooding the world with false philosophies."

1600 Youths Trained for Cleveland Industry

Cleveland

• • • **Approximately 1600** youths have been trained for semi-skilled positions in industry by the Cleveland technical high schools since last June 17, said Charles Lake, school superintendent, in a recent report. The technical schools at present are training 665 persons. Of the 452 youths enrolled in Cleveland last June 17 when the program to assist the national defense effort began, all but four have obtained jobs, said Mr. Lake. The superintendent criticized the "woeful lack of long-time planning" in training men.

FLUOR SPAR

Guaranteed 85% plus in Calcium Fluoride Not to exceed 5% silica In bulk

HILLSIDE FLUOR SPAR ROSICLARE

Barges 500 tons Ohio River from our river loading station at Rosiclare

Rail shipments from Rosiclare, Ill., on Ill. Cent. RR

WASHED GRAVEL

HILLSIDE FLUOR SPAR MINES

38 So. Dearborn St. Phone: Ran. 1151

CHICAGO, ILL.

LEE

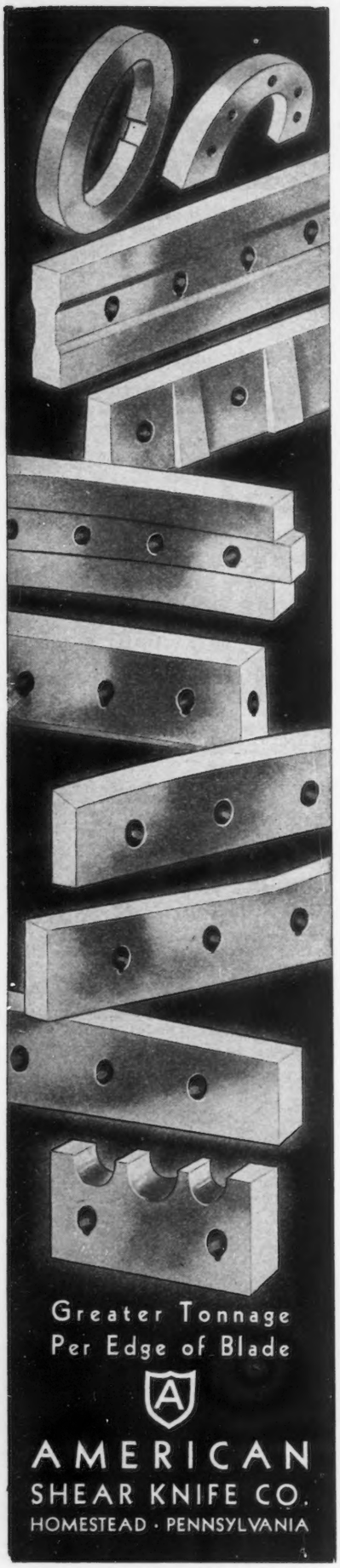
Quality Springs

ALL SHAPES • ALL SIZES • ALL MATERIALS

LEE SPRING COMPANY, Inc.

30 MAIN STREET BROOKLYN, N.Y.

LEE-BUILT TRADE MARK SPRINGS



Iowa Plants Have Few Defense Jobs

Chicago

• • • **Away from** the belching smokestacks of Detroit, Pittsburgh, Chicago, Cleveland, and Philadelphia, and particularly in the area west of the Mississippi, the defense program is taking second place to "business as usual." Business as usual in the land "where the tall corn grows" consists largely of the parts and equipment for farm implements, for washing machines and for the other regular needs of households and industry. What's more, the metal-working plants — mostly small, but surprisingly modern — aren't, generally, seeking defense work.

THE IRON AGE recently conducted a personal survey of metal-working plants in Iowa to determine how much the defense program has penetrated the non-industrial areas in the light of the defense administration's avowed purpose of spreading subcontracting as widely as possible. Iowa was chosen as a state typical of those areas away from industrial concentration but where metal-working plants have a definite place in the industrial picture, nonetheless.

Briefly, the results of this investigation showed that:

1. Of about 20 plants surveyed in four principal Iowa cities, only three had defense work and two of these were supplying parts on castings as part of their normal routine.

2. All plants, excepting two, work 40 hr. a week and are unable to work longer hours for a number of valid reasons.

3. An extreme scarcity of skilled or even semi-skilled labor exists to a degree far more acute than in the larger industrial cities.

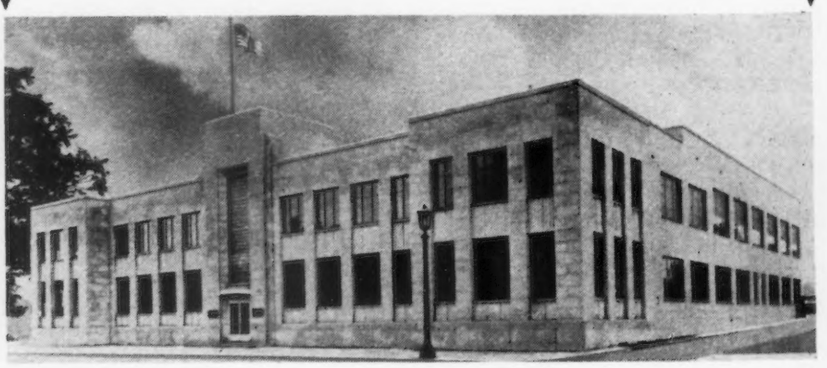
4. Practically all metal-working plants, machine shops, foundries, forges, etc., are working to capacity on regular products and are not equipped to take on defense work, unless their ordinary production is put aside. Consequently, there is no desire to secure defense orders, direct or indirect.

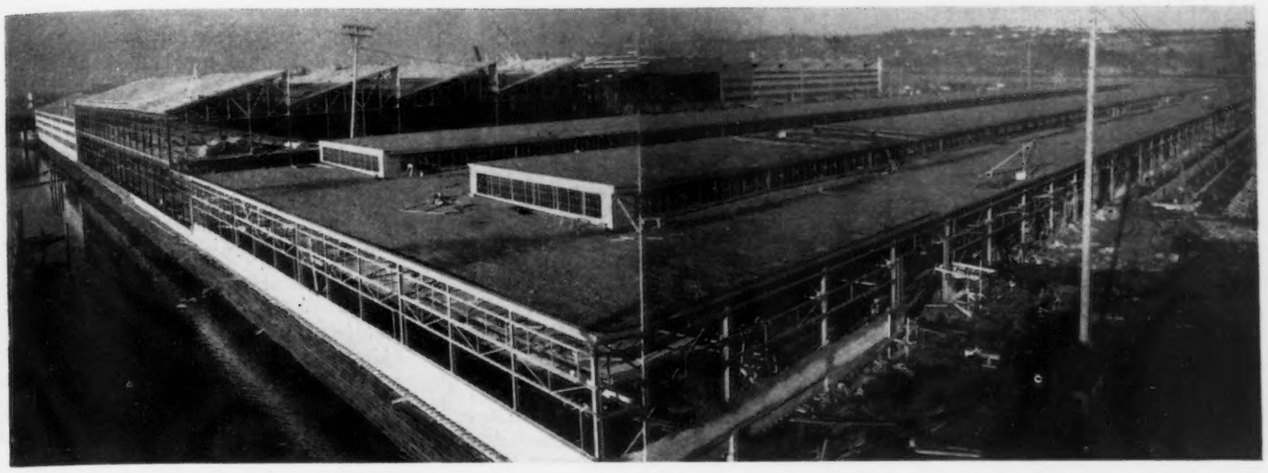
The chief reason for the lack of defense work there is the paucity of machinists and supervisors. At four o'clock one afternoon the writer walked into the shop of an automotive service equipment manufacturer. It was a beautiful shop with modern equipment throughout—the kind of shop that patently was run by machinists for machinists who built a product of which they were proud. But at four o'clock it was closed down—not a wheel turning.

Why? There were plenty of orders booked six months ahead. But enough men for an extra shift could not be begged or borrowed, and current orders don't allow enough profit for overtime.

In the city of Cedar Rapids, all metal-working plants combined

HERE IS AN exterior view of the new headquarters of Arthur G. McKee Co., Cleveland. The new building is air-conditioned, has fluorescent lighting and contains about 34,000 sq. ft. of floor space.





BOEING AIRCRAFT Co.'s 1,000,000-sq. ft. addition being built by Austin Co. at Seattle for production of "Flying Fortresses" is half completed and will be finished by March. The one-floor warehouse section in the foreground is a fifth of a mile long.

need 70 men right now—and not a single one can be had. A combination of cimcumstances can be ascribed for this labor shortage. There has been no apprentice training to speak of since 1930. Normal loss of men due to death and disability has taken about 5 per cent each year. With business active again, the nearby Rock Island Arsenal has taken men from practically all over the state. One upstate manufacturer of gear hobbers lost 10 out of a total of 28 skilled men; another saw five of his 17 machinists succumb to the arsenal's lure of 8 hr. of overtime each week, plus vacation and sick leave with pay.

As in other sections of the country, training programs are underway, supported by both government and private industry. Dubuque high schools and trade schools are going full blast and night classes are conducted only for men now working in metal shops. Manufacturers complain that this night restriction should be lifted so that inexperienced men could be trained.

In Cedar Rapids, a seven-man committee headed by the superintendent of industrial arts in the high schools and composed of three representatives from the Central Labor Council and three from management, supervises a farsighted program, which is intended to last beyond the "duration." Night classes are conducted for apprentices and employed shop men in the subjects of shop math, drafting and blueprint reading. Apprentices are also given the courses of a recognized correspondence school, from 50 per cent up to the full cost of which is refunded by the employer when the course is completed. Shop training is conducted in each plant according to its need, each management assuming complete responsibility that the shop training course will be carried out to the letter. With over 300 — ranging in age from 16 to 69 — in the classes, the immediate purpose is to improve production from the present plant forces.

In Davenport, Rock Island and Moline, Ill., which comprise the "Tri-Cities," the manufacturers' association is working in conjunction with the school board to get a similar training program started. Shops in that area are training their own men as best they can. Throughout the state, the University of Iowa is setting up courses in tool design, etc., with government support — but these classes are limited to those with a year of college education, or its equivalent.

In general, a hurried training program is being put together in every center where shops can be found but no concerted plan is evident, obviously due to the sudden necessity, which is true of the rest of the country.

All firms are busy with their regular work; some have tried subcontracting on their own, with unhappy results. As one pointed out, he had several costly rejections of machines on which subcontractors had performed faulty work.

All plants would like to step up production on their regular orders. "But how can we take on extra work," they ask, "when we can't get out as much of our usual production as we should?" Only one firm—a railroad switching engine builder—was found to be working more than 45 hr. per week. In the isolated cases where defense work was in process, the work was mostly in the company's regular line. In the Tri-Cities, where 28,000 are now employed, it was estimated that not more than 9000 are on defense production and that includes the 7500 on the Arsenal payroll. As for converting facilities to strictly defense work, the manufacturers shake their heads negatively. "Our equipment is too specialized for that. Besides, most of us are producing for agriculture or for industry and our products will be needed right through the war."

Much equipment has naturally "ossified" during the depression. An Ohio builder came out here looking for foundries capable of casting and machining engine lathe-beds. He found many 20 ft. planers, for instance, which had been forced to work on 3 ft. work during the depression and the planers were so worn in the 3 ft. section that larger jobs could not be entrusted to them today. "The closer grain demands today are

too much for some of us out here," the head of one reputable foundry said.

Other effects caused by the defense program noted in this area:

1. Firms have taken advantage of the times to sell old machinery at a price equal to that paid as long ago as 20 years.

2. Some plant and equipment facilities are available for defense purposes where normal production has fallen off for various reasons.

3. A few companies who have tried overtime have run afoul of the Walsh-Healey Act, were forced to cancel experiment due to high labor costs.

4. General labor unrest in the state's biggest industrial center has made management jittery toward taking on long-term contracts.

5. Metal-working plants there were much more active in the last war production than now; but many products made by these concerns in the last war are outmoded today and equipment currently available is adapted to these former needs.

6. An attitude of pride in the fact that industry out there is not dependent upon "shot-in-the-arm" business like defense orders is typical of the feeling in this great agricultural area.

Underneath all this is the fact that most firms are hoping they will not have to take on defense work. Only one city is doing anything about getting such business through its Chamber of Commerce and manufacturers' association — and one official reported that seven out of 10 attending the first meeting didn't really want defense orders.

Geier, Kimball on Machine Tool Priority Committee

• • • **Dexter S. Kimball,** retired dean of engineering at Cornell University, has been appointed Tools and Equipment Priority Executive by E. R. Stettinius, Jr., head of the National Defense Advisory Commission's Priorities Division. Other members of the committee are Frederick V. Geier, president, Cincinnati Milling Machine Co., representing the producers, Col. T. J. Hayes, the Army and E. C. Almy, the Navy.

Defense Contract Service Organized

Washington

• • • Creation of a Defense Contract Service to succeed the former Office of Small Business Activities was announced early this week by the Office of Production Management.

The change will transfer the Office of Small Business Activities from the Division of Purchases to the Division of Production; field offices previously established under the Federal Reserve System will be expanded and adequately staffed with business, financial, contract and engineering experts to provide decentralized advisory services to all business enterprises; and one unit, to be headed by Joseph L. Trecker and Francis J. Trecker, of Kearney & Trecker Corp., machine tool builders of Milwaukee, will pay particular attention to broadening the subcontracting system.

The Defense Contract Service, to be headed by Robert L. Mehorney, formerly director of the Office of Small Business Activities under Donald M. Nelson, is expected to give all owners of manufacturing facilities, particularly smaller units, complete information and advice on problems pertaining to defense orders.

Navy Shops Told To Farm Out Work

Washington

• • • **Acting to speed up** defense contracts, the Navy Department last week sent letters to all commandants of naval establishments directing them to "farm out" contracts as much as possible. At the same time a conference of industrial engineers, invited to Washington by Morris L. Cooke, management engineer attached to the Office of Production Management, announced that "we are making far too little use of our secondary producing facilities."

The circular letter sent out by Secretary of the Navy Frank Knox explained that the Navy recently has decentralized purchasing and contract authority to the field and and that as the defense program gathers momentum it will become "increasingly difficult to obtain and retain mechanics and to obtain additional machine tools and other plant facilities." It urged that contracts be farmed out whenever such action will expedite deliveries and avoid delays in all kinds of naval work.

"There are throughout the country industrial plants of greater or less capacity, and even small shops, which have the industrial facilities and manpower that could and should be utilized in national defense work," the letter said.

The meeting with Mr. Cooke, which was attended by James Reed, president of the Cramp Shipbuilding Co., Philadelphia, Francis Trecker, of Kearney & Trecker Co., Milwaukee, and twelve other industrial engineers, was told that Mr. Cooke's staff is currently in touch with nearly 200 local organizations which are prepared to supply information to prospective subcontractors about prime contractors.

The group concluded that the effectiveness of subcontracting has been demonstrated, that a great part if not all of existing facilities regardless of age can be brought into defense production, but that owners and managers of smaller plants have not appreciated the possibities for full defense production.

It was recommended that each prime contractor set up a group within his own organization to specialize in the handling of subcontractors, an arrangement which was said to imply "a sound, well-knit and coordinated effort" between prime contractors and his subcontractors.

(*See page* 33, THE IRON AGE *of Jan.* 30, *for a Department of Outside Work organization chart.*)

Supreme Court Upholds Labor Standards Act

Washington

• • • **The Supreme Court** on Monday upheld the constitutionality of the Fair Labor Standards Act in a decision further broadening the interstate commerce clause of the Constitution.

War Cuts Britain's Peace-Time Output 66%

Ottawa

• • • **C. D. Howe, Minister** of Munitions and Supply, summarized Canada's proposed enlarged war production program at a press conference here on Friday. He stated that Britain's peace-time industry had been reduced by two-thirds in order to promote war industry. "We will have to follow along Britain's lines," Mr. Howe said. "Britain has cut out the manufacture of civilian motor cars. So far the only step to curtail output in Canada has been higher taxation. Enforced diversion of industry is bound to come in Canada, too." Mr. Howe stated that Harry J. Carmichael, former general manager of General Motors of Canada, "a spectacular production man," would be placed in charge of munitions production. He will be Canada's chief trouble shooter. Mr. Howe outlined the general expansion of Canada's industrial front as follows:

1—Construction of destroyers in Canada.

2—Stretching of Canada's shipbuilding capacity, rather than establishing new shipyards. British orders for building freighters will be increased.

3—Addition to the government-owned Bren Gun plant at Toronto, operated by John Ingles Co.; to cost $5,000,000.

4—Production of heavy infantry tanks in the near future, the main effort to be in producing lighter land cruisers, on designs drawn jointly by British and United States experts.

5—Production of long-range bomber planes.

6—Providing in Canada all the mechanized transport needed by Great Britain outside the British Isles.

William Percival, Quebec, Que., general superintendent of Clarke Steamships, Ltd., has been appointed director of shipbuilding in the Department of Munitions and Supply, C. D. Howe, announced.

War contracts placed by the Department of Munitions and Supply for the week ended Jan. 17, numbered 1800 with total value of $92,860,324, the highest weekly total since the outbreak of the war. Of the above total, contracts valued at $26,617,744 were placed with United States companies. Orders to Canadian firms included $54,639,469 for aircraft, $51,893,000 classified only as going to various firms.

U. S. Coke Production in 1940 Rises to 57 Million Tons

• • • A total of 56,747,585 net tons of coke was produced in 1940, according to preliminary figures published by the Bureau of Mines. This compares with 44,326,600 tons in 1939, 32,495,800 in 1938 and with an annual average of 40,345,000 tons for the preceding four-year period, 1933 through 1937. The percentage increase of last year's production compared with 1939 was 28 per cent. While by-product coke was produced steadily at capacity throughout the year, beehive coke production increased by 100 per cent, the gain becoming particularly noticeable in the second half of the year. From a low in April, 1939, of 19,900 tons, the monthly beehive production rose to 462,900 tons in December, 1940.

Regionally this increase was greatest in West Virginia, where 156.7 per cent more beehive coke was produced than in 1939. The Midwestern area made the greatest advance in by-product coke and the Pennsylvania district ran second in both grades, having an output of 30,000,000 tons of by-product and 2,403,200 tons of beehive coke.

Canada's '40 Pig Iron Output 1,168,894 Tons

Toronto

• • • **Iron and steel** production in Canada for 1940 topped all previous records in pig iron, steel ingots, direct steel castings and ferroalloys.

Pig iron production totaled 1,168,894 gross tons, compared with 755,731 tons in 1939; 705,088 tons in 1938, and 898,855 tons in 1937. Output for 1940 included 974,629 tons of basic iron of which 34,772 tons were made for sale; 107,924 tons of foundry iron, all but 99 tons being for sale; 86,341 tons of malleable iron, all but 104 tons being for sale.

Pig iron production for December last totaled 110,477 gross tons against 109,576 tons in November, and compares with 94,620 tons in December, 1939.

Production of ferroalloys during 1940 made the all-time peak record of 135,412 tons, which compares with 76,375 tons in 1939; 53,522 tons in 1938 and 82,072 tons in 1937. Production included six grades as follows: ferrosilicon, spiegeleisen, silicomanganese, ferromanganese, ferrochrome, silicospiegel and ferrophosphorus.

The December output of ferroalloys totaled 18,397 tons, against 11,654 tons in November and 10,494 tons in December, 1939.

Production of steel ingots for the past year total 1,941,619 tons, making a new all-time high record, and compares with 1,330,408 tons for 1939; 1,105,427 tons in 1938, and 1,336,228 tons in 1937. Output of direct steel castings in the year amounted to 69,553 tons compared with 54,462 tons in 1939; 50,568 tons in 1938 and 66,654 tons in 1937.

Production of steel ingots and direct steel castings for the month of December amounted to 185,420 tons compared with 176,113 tons in November and 147,182 tons in December, 1939.

New Steel Capacity For Russia is Completed

• • • **According to reports** of the Department of Commerce, a geological expedition is at present mapping and investigating large iron deposits near Kovdorozero in the southeast of the Kola Peninsula, Soviet Russia. The deposit, which is claimed to be larger than the one at Magnitogorsk, is stated to consist of 50 per cent iron ore containing only traces of sulphur.

The new iron and steel plant at Komsomolsk-on-Amur, the Amurstal, is expected to begin production soon with two open hearths and two sets of rolls for sheets. The 110,000,000 ruble project is expected to supply eventually all local demands for rolled materials.

A commission is studying the district of Tbilisi in the Transcaucasus to select a site for a new iron and steel plant.

Workers Promised Piece Rates Will Hold

ONE reason munition contracts being manufactured by Massachusetts firms have not been speeded up is said to be a feeling among workers that if they make more than $40 or $45 a week on piece work, the rate setters would cut the pay rate. If piece rates were frozen at current levels for the duration of the emergency, it is said, output could be tuned up at least 25 per cent.

Knowing his workmen, a Springfield, Mass., manufacturer of fire arms with British government contracts recently enclosed the following notice in pay envelopes:

"Smith & Wesson wants to do everything possible for defense, and to that end asks all employees to help. Production is needed. The company in order to assist in defense work announces that no reduction in any piece price or day rate will be made on such work. Make all you can and the more you make the better we will like it. Harold Wesson, president, Smith & Wesson, Inc."

Republic to Air Condition Stack at Thomas Works

Birmingham

• • • **Announcement that** Republic Steel Corp. will install air conditioning equipment on one of its two blast furnaces at the Thomas Works here has been made by C. L. Bransford, district manager. When the installation is completed in about three months, four blast furnaces in the district will have been provided with modern air-conditioning equipment.

In announcing the Republic development, Mr. Bransford said moisture in the air here varied from eleven grains to about two grains per cu. ft. and the equipment to be installed at the Thomas Works will make it possible to blast the furnace with uniform moisture content in the air. This content, he said, will approximate three grains per cu. ft. The refrigerating equipment will be driven by steam turbines, operating at high speed.

S. E. HACKETT (above), formerly president of Jones & Laughlin Steel Corp., is scheduled to take a position in the Raw Materials Division of the National Defense Advisory Commission as assistant to W. A. Harriman.

107,250 Men Needed to Produce Bomber Parts

Detroit

• • • **The program** undertaken by the automobile industry to produce parts and assemblies for bombers will require employment of at least 107,250 men in this industry, according to C. C. Carlton, managing director of the Automotive Committee for Air Defense.

Parts and assemblies sufficient to manufacture five Consolidated B-24 bombers daily will be undertaken by Ford Motor Co.; General Motors Corp. will provide units for five North American B-25 bombers, while Chrysler Corp. will cooperate with several other companies in supplying assemblies for five Martin B-26 bombers daily.

Machine Tool Output May Reach $750 Million

Cleveland

• • • **Machine tool production for 1941 will total $750,000,000, an increase of $300,000,000 over 1940, it was announced Feb. 4 by Clayton R. Burt, chairman of the defense committee of the National Machine Tool Builders Association, following an industry-wide study of ways and means to accelerate production.**

Machine Tools Limited To Holders of Priorities

Washington

• • • **All machine tool** builders were requested in a letter last Friday from Director of Priorities Edward R. Stettinius, Jr., not to deliver machine tools to any customer after Feb. 28 unless that customer has obtained a priority rating.

The request has opened discussion of the prospect of similar action being taken regarding a broad list of other defense products such as steel and non-ferrous metals, if not the actual setting up of a formal comprehensive priority system in place of the voluntary preference rating.

Effect of the Stettinius request, it was announced, will be to give the defense program first call on the total output of the machine tool industry. Commercial users will be compelled to wait for deliveries from the hard-pressed industry until it has served defense requirements and some sources predicted this would mean a year or more. Hardest hit, it was stated, will be the automobile manufacturers who are reported to have curtailed new machine tool requirements to as few as possible.

Despite the increased expansion of the machine tool industry and its tempo of output, defense industries continue to report growing shortage of machine tools. Machine tool makers, it was reported, are now accepting orders for delivery in six months to one year.

Text of the Stettinius letter to machine tool manufacturers follows.

"Inasmuch as machine tools are so urgently needed, it has been decided, in order to conserve the supply for national defense needs, that we ask you to cease making shipments of machine tools beginning 30 days from the date of this letter, except to those customers who have by that time or thereafter secured official priority ratings.

"Please communicate with this office if you experience difficulty in the application of this request."

Personals

Change is inevitable in progressive Industry. Change is constant.

• **J. Heber Parker,** for the past 25 years vice-president of the Carpenter Steel Co., Reading, Pa., has been elected president of that company. He succeeds the late Fred A. Bigelow, who had served as president since 1920.

Mr. Parker began his steel career in the chemical laboratory of the Carpenter Steel Co. during his college vacations. After graduating from Cornell, he entered the crucible department of the company. In 1906 he was named assistant superintendent; in 1910 became chief metallurgist, and in 1916 was elected vice-president. Much of the company's research and development work on free-machining stainless steels and other modern alloy steel products has been carried out under his direction.

• **D. A. Samson,** formerly operating manager of the Dodge main plant of Chrysler Corp., has been appointed operating manager of the newly leased plant on Warren Avenue, formerly Graham-Paige, and will supervise the Chrysler project for the manufacture of airplane parts to be made under the national defense program. Since last October, Mr. Samson has devoted all his time to study of problems in the manufacture of airplane parts. When the new plant under his direction is equipped, it is expected to produce five fuselages per day for the Martin B-26 bomber. Mr. Samson has been with Dodge since 1915. A graduate of University of Michigan and an electrical engineer, he spent his first 11 years with Dodge in planning and directing construction of plants for that company.

• **Guy T. Avery** has been made works manager of the Riverdale plant of Acme Steel Co., Chicago, where the majority of Acme products are now manufactured. Mr. Avery has been with Acme Steel since February, 1920, when the operations at Riverdale were considerably smaller than they are today. As assistant works manager he directed the processing of the company's general line items. A graduate of the University of Illinois, school of engineering, Mr. Avery served with the U. S. Navy as chief machinist's mate during the last war before his service with a firm of consulting engineers which preceded his association with Acme.

• **Charles E. Robinson** has been made secretary-manager of the Pittsburgh Commission for Industrial Expansion, succeeding **Mark S. James.** Mr. Robinson has been acting secretary-manager since June, 1939, when Mr. James left to become deputy secretary of the Pennsylvania State Department of Commerce.

H. S. Wherrett has been named as representative on the business council succeeding **F. J. Chesterman,** resigned.

• **Dr. Vsevolod Krivobok** has resigned his professorship in the department of metallurgy at Carnegie Institute of Technology, Pittsburgh, to become director of research at the Lockheed Aircraft Corp., Burbank, Cal. He had been with Carnegie Tech since 1925, but since 1931 when he was made associate director of research in charge of stainless steel for Allegheny Steel Corp., his teaching at "Tech" had been on a part-time basis.

• **Edward M. Bell,** treasurer, Cleveland Tractor Co., Cleveland,

J. HEBER PARKER, new president of Carpenter Steel Co.

D. A. SAMSON, operating manager of Chrysler plant for manufacture of airplane parts.

GUY T. AVERY, works manager of Riverdale plant of Acme Steel Co.

PERCY JENKINS, manager of Boston branch of John A. Roebling's Sons Co.

has been elected vice-president and treasurer and **Herbert P. Mee,** executive vice-president, was made vice-president.

• **Raymond S. Livingstone,** personnel director, Thompson Products, Inc., Cleveland aircraft parts maker, is the recipient of the annual Cleveland Junior Chamber of Commerce distinguished service award for 1940.

• **J. H. Sanford** has been made manager, mining division, Ohio Brass Co., Mansfield, Ohio, succeeding the late John C. Wilson. **Floyd F. Smith,** formerly engineering secretary, has been named assistant manager, mining division. Mr. Sanford has been with the company since 1920 and Mr. Smith since 1923.

• **W. W. Knight, Jr.,** Toledo, who has been assisting John D. Biggers in Washington in the new Office of Production Management, will head the subdivision dealing with tanks and combat vehicles.

• **E. N. Horr** has been elected vice-president and general manager of Cowles Detergent Co., Cleveland; **C. C. Bassett,** vice-president and director of sales; **C. C. Barrett,** secretary and treasurer; and **C. H. Fisher,** assistant secretary and assistant treasurer.

Mr. Horr has been with the company since 1921, most recently in charge of production and purchasing. Mr. Bassett joined the company in 1931 and since 1932 has managed the Mitchell Wing division at Cambridge, Mass. Mr. Barrett has served the company as secretary since 1927 and Mr. Fisher has been tax specialist and accountant since 1929.

• **Percy Jenkins,** who was associated with the Wickwire Spencer Steel Co. for more than 15 years, recently as manager of sales, New England district, has been appointed manager of the Boston branch of John A. Roebling's Sons Co., Trenton, N. J. He joined the Wickwire Spencer company in 1924 after his graduation from Harvard University.

• **L. F. McGlincy,** heretofore division metallurgist in heating and hot rolling at the main plant in Cleveland of American Steel & Wire Co., has been made general superintendent of the Donora, Pa., works of the company, succeeding **A. F. White,** who has been appointed assistant to the manager of operations of the Pittsburgh district. **Richard R. Snow,** who has been assistant superintendent of open hearths and hot rolling at the Worcester plant, will assume Mr. McGlincy's post in Cleveland, and **U. F. Corsini,** assistant general foreman of the Worcester rod mills, has become assistant superintendent of open hearths.

Mr. McGlincy joined the Worcester works in an industrial engineering capacity in 1924, and Mr. White has spent 30 years at the Donora plant.

L. F. McGLINCY, general superintendent of Donora works, American Steel & Wire Co.

C. G. WOLLAEGER, assistant general sales manager, Milcor Steel Co.

• **C. G. Wollaeger,** since 1934 assistant manager of the fireproof and specialties division of the Milcor Steel Co., Milwaukee, has been appointed assistant general sales manager. He has been identified with the company since his graduation from the University of Wisconsin in 1926. **W. G. Baum** has been designated to take Mr. Wollaeger's place in the fireproof and specialties division. **Paul Dunn** has been transferred to Chicago to take over the fireproof sales work formerly handled by Mr. Baum.

• **Ralph R. Newquist** has been appointed manager of the Houston district office of Allis-Chalmers Mfg. Co., Milwaukee. Since joining the company in 1934, Mr. Newquist has been stationed in the district offices at Chicago and Pittsburgh, and more recently at Boston. Prior to that he was connected with several other engineering and electrical concerns.

• **George A. Murphy, Jr.,** has been appointed to the industrial sales division of American Steel Foundries. Mr. Murphy started and acquired his foundry experience under the direction of Dr. Fahrenwald of the Fahralloy Co. He was educated in Cincinnati and will have his headquarters with Amer-

ican Steel Foundries at East Chicago, Ind.

• **E. Bryan Williams,** since 1928 chief traffic engineer with the St. Louis Public Service Co., and **Philip M. Nigro,** until recently a professor of mathematics at Loyola College, Montreal, have joined the staff of the research and testing laboratory of the Torrington Mfg. Co., Torrington, Conn.

• **M. W. Rogers,** formerly general factory manager in charge of production of Caterpillar Tractor Co., has been elected president of the following companies: Universal Unit Power Shovel Corp., Milwaukee; Potts Machine Co., Jackson, Mich., and Davies & Thompson Co., Milwaukee.

• **L. E. Osborne,** for five years works manager of the Westinghouse Electric & Mfg. Co., East Springfield, Mass., plant, and manager of manufacturing and engineering of the company has been granted a leave of absence to join the staff of the defense committee, Office of Production Management. **John H. Ashbaugh,** engineering manager at the East Springfield plant, has been made assistant manager of manufacturing and engineering for the division.

• **Myron C. Taylor,** personal envoy to the Vatican of President Roosevelt, left the New England Baptist Hospital, Boston, Jan. 20, for a vacation at Palm Beach, Fla. He is convalescing from a recent operation.

• **S. F. Briggs** was elected chairman of the board of directors of the Outboard, Marine & Mfg. Co., at its annual meeting held in Waukegan, Ill.

• **W. E. Hedgcock** who, since March 29, 1940, has been acting head of the sales department of American Car & Foundry Co., New York, has been appointed vice-president in charge of sales.

• **R. S. Wensley** has been elected chairman of the board of the Harshaw Chemical Co., Cleveland. He has served the company for 42 years. **E. B. Greene,** president, Cleveland Cliffs Iron Co., has been named to the executive committee.

• **Robert T. Harris,** manager of construction equipment department, Blaw-Knox Co., was elected a director of the manufacturers division of the American Road Builders Association last week.

Obituary

• **Col. William Guy Walls,** automotive engineer in the Army Ordnance Department and a former president of the Society of Automotive Engineers, died of heart disease at his home in Indianapolis, Jan. 16, aged 65 years.

• **Owen B. Church,** traffic manager of the R. C. Mahon Co., Detroit, died recently. A graduate of Lehigh University, he went to Detroit in 1914 and was employed at Detroit Steel Products Co. until 1934 when he went with the Mahon Co. He was 48 years old.

• **Frank G. Keller,** automobile production man, died recently at Detroit. Mr. Keller, who was born in Upper Sandusky, Ohio, 62 years ago, was general manager of the production department of Buick Motor Car Co. early in the company's history. He joined Chrysler Corp. in 1920 and for several years was stationed at the corporation's plant in Elizabeth, N. J., later returning to Detroit.

• **Arthur L. Holmes,** owner of the Holmes Screw Machine Products Co., Cleveland, died Jan. 23, after a short illness. He formerly was widely known around Cleveland as a minor league ball player.

• **Henry H. Schuize,** assistant to William H. Collins, general manager of the Bethlehem Steel Co.'s Fore River works, Quincy, Mass., died in Quincy on Jan. 22 following a short illness. He was 65 years old and first became associated with the works as chief estimator under Admiral Francis Bowles, remaining there until 1917, when he went to the Bethlehem, Pa., plant. He returned to Quincy in 1927 as assistant to Mr. Collins.

• **John H. Brown,** vice-president of the stove manufacturing concern of S. M. Howes Co., died at his home in Brighton, Mass., on Jan. 24. He was a native of Cambridge, Mass., and was associated with the stove business more than 50 years.

• **Francis B. Griffin,** formerly secretary and treasurer of C. E. Jennings & Co., New York, died Jan. 24 in New Haven, Conn., at the age of 88 years. Mr. Jennings had also been an officer of the Jennings & Griffin Mfg. Co. of Yalesville, Conn., and Port Jervis, N. Y., and the Wilbur Corp. of New Haven.

• **Charles F. Blankschaen,** retired general superintendent of the Acme Machinery division of the Hill-Acme Co., Cleveland, died Jan. 18 at the age of 76. He retired in 1916.

• **Frank X. Pund,** vice-president of the D. T. Williams Valve Co., Cincinnati, died Jan. 21.

• **Albert T. Keller,** former chief engineer of construction of the Bethlehem Steel Co., died recently. Mr. Keller, a native of Pittsburgh, had been associated with the steel industry for 50 years, having first been connected with the Mesta Machine Co. and the Carnegie Steel Co. He joined the Bethlehem Steel Co. in 1916 as chief engineer of construction at Sparrows Point, Md. In 1923 he was transferred to Bethlehem to serve in the same capacity. He retired in 1939, but was recently recalled to active service.

• **Edward M. Decker,** who retired in 1928 after 30 years with the American Radiator Co., died recently. He was 76 years old.

• **Howard E. Doughty,** president and general manager of Lorenson-Matthews Mfg. Co., Dickson City, Pa., died Jan. 17, aged 49 years. A native of Philadelphia, he was formerly associated with the Link-Belt Co., Philadelphia, and the Gifford-Wood Co., Hudson, N. Y. He became president and general manager of the Lorenson-Matthews company in 1928 in which capacity he served until his death.

• **Sir David Richard Llewellyn,** prominent in Welsh heavy industry, died at the age of 61. He had been associated with the late Lord Buckland in the purchase of John Lysaght, Ltd., and when that steel firm was merged with Guest Keen & Nettlefolds, he became a director. At the time of his death, he was chairman of John Lysaght, Ltd., Guest Keen Baldwins Iron & Steel Co. and Amalgamated Anthracite Collieries.

Metal Working Activity

. . . Latest Data Assembled by The Iron Age

From Recognized Sources. In Net Tons.

	Dec. 1940	Nov. 1940	Dec. 1939	12 Months 1940	12 Months 1939
Steel Ingots:					
Monthly output[a]	6,300,768	6,282,824	5,822,014	65,246,953	51,584,986
Average weekly output[a]	1,425,513	1,464,528	1,317,198	1,248,029	989,355
Per cent of capacity[a]	93.92	96.49	86.13	82.22	64.70
Pig Iron:					
Monthly output[b]	4,414,602	4,403,230	4,220,536	46,815,906	35,317,374
Raw Materials:					
Coke output[c]	5,352,503	5,143,521	5,031,797	56,747,585	44,425,123
Lake Ore consumed[d]	6,913,803	6,689,768	6,202,979	69,917,472	49,684,644
Scrap iron consumed	.....	4,392,640	4,262,000	*42,265,000*	39,207,000
Castings:					
Malleable orders[e]	.....	64,612	45,978	*505,264*	489,482
Steel orders[e]	.....	94,929	64,143	*701,576*	685,074
Finished Steel:					
Trackwork shipments[a]	7,151	5,733	6,768	79,539	68,663
Fabricated shape orders[f]	203,124	129,257	84,383	1,748,144	1,305,049
Fabricated plate orders[e]	*	*	23,627	*	357,393
U. S. Steel Corp. shipments[g]	1,544,623	1,425,352	1,443,969	14,976,110	11,707,251
Fabricated Products:					
Automobile production[h]	475,000††	510,973	452,142	4,480,000††	3,577,292
Steel furniture shipments[e], value	.....	$2,884,044	$2,159,729	*$26,176,613*	$22,609,168
Steel boiler orders[e] (sq. ft.)	1,562,611	1,722,306	553,796	17,233,295	11,098,316
Locomotives ordered[i]	80	58**	127	677**	415
Freight cars ordered[i]	7,637	6,410**	4,381	64,871**	56,915
Machine tool index[j]	96.8	95.4	93.3	93.6†	70†
Foundry equipment index[k]	257.8	254.2	*	183.7†	*
Gear sales index	208	173	111	155†	103
Non-Ferrous Metals: (U. S. only)					
Lead shipments[l]	56,755	57,510	44,881	603,143	555,074
Lead stocks[l]	40,926	35,791	58,777	.....	.....
Zinc shipments[m]	65,385	62,295	53,468	696,497	598,972
Zinc stocks[m]	12,884	18,368	65,995	.....	.....
Tin deliveries[n]	10,481	14,006	12,730	129,357	80,523
Refined copper deliveries[o]	112,671	102,483	*	1,001,886	814,407
Refined copper stocks[o]	142,772	158,418	159,485	.....	.....
Exports:					
Total iron and steel[p]	.....	882,757	672,489	*10,979,886*	6,805,600
All rolled and finished steel[p]	.....	386,756	314,711	*4,180,540*	2,109,527
Semi-finished steel[p]	.....	367,984	88,072	*2,991,524*	368,360
Scrap[p]	.....	83,271	228,814	*3,083,481*	3,977,780
Imports:					
Total iron and steel[p]	.....	1,098	16,474	*59,628*	352,980
Pig iron[p]	.....	110	1,476	*11,471*	43,223
All rolled and finished steel[p]	.....	492	3,748	*14,567*	175,512

Data in italics are eleven months' totals.

Sources of data: [a] American Iron and Steel Institute; [b] THE IRON AGE; [c] Bureau of Mines; [d] Lake Superior Iron Ore Association; [e] Bureau of the Census; [f] American Institute of Steel Construction; [g] United States Steel Corp.; [h] Preliminary estimates by THE IRON AGE—Final figures from Bureau of the Census, U. S. only; [i] *Railway Age;* [j] National Machine Tool Builders Association; [k] Foundry Equipment Manufacturers Association; [l] American Bureau of Metal Statistics; [m] American Zinc Institute; [n] New York Commodity Exchange; [o] Copper Institute; [p] Department of Commerce; [r] Institute of Scrap Iron and Steel; [s] American Gear Manufacturers Association.

* Not available. † Monthly averages. ††Estimated.

Pig Iron Output in January Almost at Capacity

Production of coke pig iron in January totaled 4,663,695 net tons, compared with a revised total of 4,547,602 tons in December. On a daily basis, production in January rose 2.5 per cent over that in the previous month, or from 146,697 net tons a day in December to 150,441 tons in January. The operating rate for the industry reached 99.5 per cent of capacity, compared with 97.2 in December.

There were 205 furnaces in blast on Feb. 1, operating at the rate of 152,040 tons a day, compared with 202 on Jan. 1, making 146,770 tons. The United States Steel Corp. blew in three furnaces, and independent producers blew in one unit and took one off blast.

Operating Rate at 99.5% of Capacity, Increase of 2.5% Over December

Among the furnaces blown in were: One Donora, American Steel & Wire Co.; one Ohio, Carnegie-Illinois Steel Corp.; one Ensley, Tennessee Coal, Iron & Railroad Co., and one Calumet, Wisconsin Steel Co.

Bethlehem Steel Co. blew out Bethlehem A unit for rebuilding. This company is also rebuilding Steelton E stack.

Production by Districts and Coke Furnaces in Blast

(In Net Tons)

FURNACES	Jan., 1941	Dec., 1940	Jan., 1940	Feb. 1, 1941: Number in Blast	Feb. 1, 1941: Operating Rate, Net Tons a Day	Jan. 1, 1941: Number in Blast	Jan. 1, 1941: Operating Rate, Net Tons a Day
Eastern	38,014	39,512	16,067	2	1,225	2	1,275
Buffalo	284,661	281,712	237,096	12	9,185	12	9,085
Philadelphia	394,080	399,560	367,353	16	12,585	17	12,890
Ferro. and Spiegel	18,741	16,117	18,417	4	605	4	580
Pittsburgh	1,128,690	1,108,498	1,042,059	48	36,775	47	35,765
Ferro. and Spiegel	26,161	26,556	36,314	3	845	3	860
South Ohio River	102,345	97,555	90,708	7	3,300	7	3,150
Valleys	589,143	535,021	456,197	24	19,495	23	17,725
Wheeling	220,622	215,075	152,489	9	7,115	9	6,950
Cleveland	394,821	379,033	298,481	16	12,735	16	12,225
Chicago	953,101	*940,789	843,600	36	31,195	35	*30,350
St. Louis	.....	.....	.....	..	.....	..	.....
Detroit	119,801	115,733	115,702	5	3,865	5	3,735
Western	72,035	66,793	63,907	4	2,325	4	2,155
Southern	319,111	322,862	292,412	18	10,715	17	9,935
Ferromanganese	2,369	2,786	218	1	75	1	90
Total	4,663,695	4,547,602	4,022,020	205	152,040	202	146,770

*Revised.

Production of Coke Pig Iron and Ferromanganese

(All Figures in Net Tons)

	Pig Iron* 1941	Pig Iron* 1940	Ferromanganese† 1941	Ferromanganese† 1940
January	4,663,695	4,032,022	35,337	43,240
February	.....	3,311,480	.....	38,720
March	.....	3,270,499	.....	46,260
April	.....	3,137,019	.....	43,384
May	.....	3,513,683	.....	44,973
June	.....	3,818,897	.....	44,631
½ year	.....	21,083,600	.....	261,208
July	.....	4,053,945	.....	43,341
August	.....	4,238,041	.....	37,003
September	.....	4,176,527	.....	33,024
October	.....	4,445,961	.....	32,270
November	.....	4,403,230	.....	31,155
December	.....	4,547,602††	.....	35,666
Year	.....	46,948,906	.....	473,667

*These totals do not include charcoal pig iron. †Included in pig iron figures. ††Revised.

Daily Average Production of Coke Pig Iron

	1941	% Capacity	1940	% Capacity
January	150,441	99.5	130,061	85.8
February	.....	...	114,189	75.1
March	.....	...	105,500	68.9
April	.....	...	104,567	68.6
May	.....	...	113,345	74.8
June	.....	...	127,297	83.9
½ year	.....	...	115,844	76.1
July	.....	...	130,772	86.3
August	.....	...	136,711	90.4
September	.....	...	139,218	92.2
October	.....	...	143,418	94.8
December	.....	...	146 697	97.2
Year	.....	...	128,276	84.6

Merchant Iron Made, Daily Rate

	1941	1940	1939	1938	1937
January	20,812	16,475	11,875	11.911	18,039
February	....	14,773	10,793	9,916	18,496
March	....	11,760	10,025	9,547	18.432
April	....	13,656	9,529	9,266	16,259
May	....	16,521	7,883	7,203	21,821
June	....	13,662	8 527	6,020	17,774
July	....	16,619	9,404	6,154	21,962
August	....	17,395	11.225	7,408	19,971
September	....	17,571	12,648	12.550	22.473
October	....	18,694	16,409	12,095	21,224
November	....	22,792	16,642	14,793	17,541
December	....	19,779	16,912	10,226	12.280

Toland Urges 30-Day Notice of Strike Intent

Milwaukee

• • • **Unless Congress** enacts a law that will require unions to give a 30 day notice of intent to strike the defense program will be hindered seriously by constant labor disputes, according to Edmund M. Toland, general counsel for the congressional committee investigating the National Labor Relations Board, in an interview while in Milwaukee. He was the speaker before a closed meeting of the Employers' Association of Milwaukee, the Milwaukee chapter of the American Foundrymen's Association, the Milwaukee branch of the American Society for Metals and the Industrial Relations Association of Milwaukee.

The Iron Age Comparison of Prices

Advances Over Past Week in Heavy Type; Declines in Italics

	Feb. 4 1941	Jan. 28 1941	Jan. 7 1941	Feb. 6 1940
Flat Rolled Steel:				
(Cents Per Lb.)				
Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Tin and Terne Plate:				
(Dollars Per Base Box)				
Tin plate	$5.00	$5.00	$5.00	$5.00
Manufacturing ternes	4.30	4.30	4.30	4.30
Bars and Shapes:				
(Cents Per Lb.)				
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Wire and Wire Products:				
(Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55
Rails:				
(Dollars Per Gross Ton)				
Heavy rails	$40.00	$40.00	$40.00	$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel:				
(Dollars Per Gross Ton)				
Rerolling billets	$34.00	$34.00	$34.00	$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Wire Rods and Skelp:				
(Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	2.00
Skelp (grvd)	1.90	1.90	1.90	1.90

	Feb. 4 1941	Jan. 28 1941	Jan. 7 1941	Feb. 6 1940
Pig Iron:				
(Per Gross Ton)				
No. 2 fdy., Philadelphia	$25.84	$25.84	$25.84	$24.84
No. 2, Valley furnace	24.00	24.00	24.00	23.00
No. 2, Southern Cin'ti	24.06	24.06	23.06	23.06
No. 2, Birmingham	19.38	19.38	19.38	19.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	23.00
Basic, del'd eastern Pa.	25.34	25.34	25.34	24.34
Basic, Valley furnace	23.50	23.50	23.50	22.50
Malleable, Chicago†	24.00	24.00	24.00	23.00
Malleable, Valley	24.00	24.00	24.00	23.00
L. S. charcoal, Chicago	30.34	30.34	30.34	30.34
Ferromanganese‡	120.00	120.00	120.00	100.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton. ‡For carlots at seaboard.

Scrap:				
(Per Gross Ton)				
Heavy melt'g steel, P'gh.	*$21.25*	$21.50	$23.75	$17.75
Heavy melt'g steel, Phila.	20.00	20.00	21.50	17.50
Heavy melt'g steel, Ch'go	*19.25*	19.75	20.75	16.00
Carwheels, Chicago	20.75	20.75	21.75	16.50
Carwheels, Philadelphia	23.00	23.00	23.25	20.25
No. 1 cast, Pittsburgh	22.25	22.25	22.75	18.75
No. 1 cast, Philadelphia	23.75	23.75	23.75	20.25
No. 1 cast, Ch'go (net ton)	18.75	18.75	19.25	14.00
Coke, Connellsville:				
(Per Net Ton at Oven)				
Furnace coke, prompt	$5.50	$5.50	$5.50	$4.00
Foundry coke, prompt	5.75	5.75	5.75	5.50
Non-Ferrous Metals:				
(Cents per Lb. to Large Buyers)				
Copper, electro., Conn.*	12.00	12.00	12.00	11.625
Copper, Lake, New York	12.00	12.00	12.00	11.625
Tin (Straits), New York	50.375	50.15	50.10	45.125
Zinc, East St. Louis	7.25	7.25	7.25	5.50
Lead, St. Louis	5.35	5.35	5.35	5.10
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

*Mine producers only.

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 115-124 herein.
On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Composite Prices

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Feb. 4, 1941	2.261c. a Lb.	$23.44 a Gross Ton	$20.17 a Gross Ton
One week ago	2.261c. a Lb.	$23.44 a Gross Ton	$20.42 a Gross Ton
One month ago	2.261c. a Lb.	$23.44 a Gross Ton	$22.00 a Gross Ton
One year ago	2.261c. a Lb.	$22.61 a Gross Ton	$17.08 a Gross Ton

	High	Low	High	Low	High	Low
1941						
1940	2.261c., Jan. 2	2.211c., Apr. 16	$23.44, Dec. 23	$22.61, Jan. 2	$22.00, Jan. 7	$20.17, Feb. 4
1939	2.286c., Jan. 3	2.236c., May 16	22.61, Sept. 19	20.61, Sept. 12	21.83, Dec. 30	16.04, Apr. 9
1938	2.512c., May 17	2.211c., Oct. 18	23.25, June 21	19.61, July 6	22.50, Oct. 3	14.08, May 16
1937	2.512c., Mar. 9	2.249c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	15.00, Nov. 22	11.00, June 7
1936	2.249c., Dec. 28	2.016c., Mar. 10	19.74, Nov. 24	18.73, Aug. 11	21.92, Mar. 30	12.92, Nov. 10
1935	2.062c., Oct. 1	2.056c., Jan. 8	18.84, Nov. 5	17.83, May 14	17.75, Dec. 21	12.67, June 9
1934	2.118c., Apr. 24	1.945c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.42, Dec. 10	10.33, Apr. 29
1933	1.953c., Oct. 3	1.792c., May 2	16.90, Dec. 5	13.56, Jan. 3	13.00, Mar. 13	9.50, Sept. 25
1932	1.915c., Sept. 6	1.870c., Mar. 15	14.81, Jan. 5	13.56, Dec. 6	12.25, Aug. 8	6.75, Jan. 3
1931	1.981c., Jan. 13	1.883c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	8.50, Jan. 12	6.43, July 5
1930	2.192c., Jan. 7	1.962c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	11.33, Jan. 6	8.50, Dec. 29
1929	2.236c., May 28	2.192c., Oct. 29	18.71, May 14	18.21, Dec. 17	15.00, Feb. 18	11.25, Dec. 9
					17.58, Jan. 29	14.08, Dec. 3

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Based on averages for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Summary of the Week

• Iron and steel priority committee now aiding defense contractors, but mandatory priorities will be avoided as long as possible... Machine tools now covered by formal priorities . . . Rush of non-defense business is giving steel mills greatest concern . . . Effect of possible wage increase feared.

WITHOUT yet resorting to the use of mandatory priorities, the iron and steel committee of the Priorities Board is exercising greater control of the steel situation so far as defense projects are concerned. Although the iron and steel committee has been functioning less than two weeks, it has been called upon to arrange for sources of supply and definite shipping schedules for a number of defense projects that have had to be crowded into steel rolling schedules that are growing tighter and tighter.

The adoption of definite priority ratings for machine tools, which must have the approval of the Director of Priorites, and the prospect that priorities may be established in some other lines, notably zinc, have not changed the situation with respect to steel, for which mandatory priorities will be avoided as long as possible.

It is not defense projects that are giving the steel mills greatest concern, however, but the rush of miscellaneous buying, which has filled up mill schedules for three to four months, with some deliveries extending to the end of the third quarter. Considerable juggling of mill schedules becomes necessary whenever defense or semi-defense projects not hitherto provided for are sandwiched in. Material for railroad cars and repairs affords an example of the requirements for which no priorities are asked, but which command some degree of preference.

Notwithstanding the difficulties which steel companies are encountering, deliveries on orders in which the impossible was not demanded have generally been on schedule.

A survey by a leading company of several thousand of its commitments disclosed that shipment was made "on time" in more than 85 per cent of the cases surveyed. Commercial users who have no defense contracts have been discommoded chiefly when they take on additional work for which steel over and above their regular quotas would be required. Steel companies continue to ask for better cooperation from their customers so that steel is not shipped out before it is actually needed. A survey of steel inventories of consumers and warehouses has been suggested to the Iron and Steel Priority Committee as a means of determining whether speculative buying has been excessive.

THE rapid pace of steel making has brought a number of furnace shutdowns this week, six districts showing losses and bringing the rate for the industry down to 96 per cent, one point below last week. While most of the larger plants are operating at slightly above or below 100 per cent, some small steel companies have still to attain maximum production. A better distribution of defense orders and the reallocation of some business now on the books of the busier mills, as was promised by a group of steel company executives after a conference with William S. Knudsen, may bring full utilization of existing capacity before further additions are undertaken. However, the representatives of the industry pledged expansion of facilities wherever it may be found necessary.

Informal conferences between the Steel Workers Organizing Committee and the United States Steel Corp. on wages and related subjects will be resumed this week. While there is no present basis on which to predict the outcome, there is apprehension as to the widespread economic effect that would come from a horizontal increase in steel wages. Already committed to a policy of no price advances so long as costs do not mount excessively, steel company managements see the beginning of an inflationary price trend, which government and industry have been seeking to forestall, if wages are advanced. Many manufacturers in metal-working and other lines base their wage rates on what steel companies pay, being forced to do so by labor conditions in various districts. Hence a wage increase in steel would have far-reaching economic effects.

PIG iron output in January totaled 4,663,695 net tons compared with a revised figure of 4,547,602 tons in December. The daily average in January was 150,441 tons, which was a gain of 2½ per cent over the December rate of 146,697 tons. There were 205 furnaces in blast on Feb. 1, a gain of three in the month. The total number of coke furnaces which possibly could be operated is 224, but many of these would require extensive repairs. The $1 advance in pig iron prices put into effect by a number of producers in December has spread to the South, where one producer has made sales at the higher level.

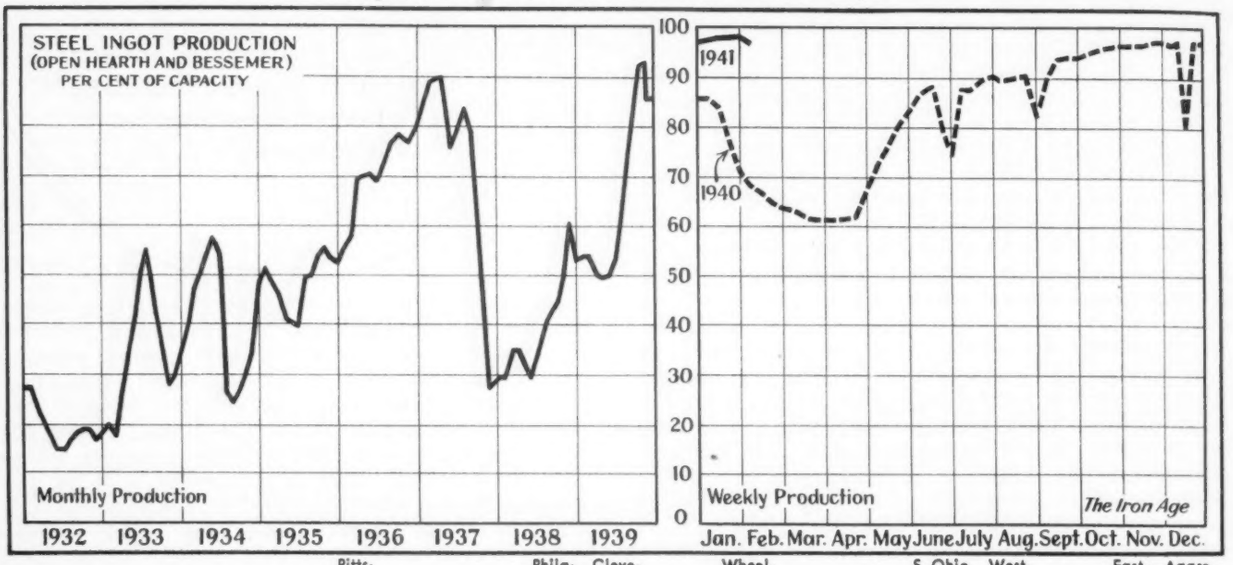
Further efforts of the Price Stabilization Division of the National Defense Commission to bring about a lower level of scrap prices has added to the confusion in the trade, particularly at Pittsburgh. Unless differentials for other districts are established sufficiently below the Pittsburgh level, that district will not be able to draw the scrap it needs from other districts, and a shortage threatens. THE IRON AGE scrap composite is slightly lower at $20.17.

The Industrial Pace . . .

CHIEFLY BECAUSE OF A DROP in heavy engineering construction volume THE IRON AGE index of capital goods activity eased off 1½ points to 125.5 in the past week. In the preceding week the index stood at 127.0, a month ago at 120.5 and, in the corresponding week of 1940, at 92.3. Steel ingot production was down four points on the basis of revised capacity figures, and the automobile component rose to 132.6 when assemblies increased to 124,400, as compared with 121,948 in the preceding week. The lumber carloadings and Pittsburgh activity series were unchanged.

FABRICATED STRUCTURAL SHAPE bookings in December, 203,124 tons, were 43 per cent above November and the third highest of the year, being exceeded by 240,942 tons in October, and 225,494 tons in September. The December total in 1939 was 84,383 tons. Value of new orders received by manufacturers in December declined less than seasonally. At 212 for the month, the index compared with 210 in November, and 121 in December, 1939. Inventories in December advanced 1 per cent, continuing the gradual rise evident throughout 1940. The December index was 125.5, as against 124.3 in November.

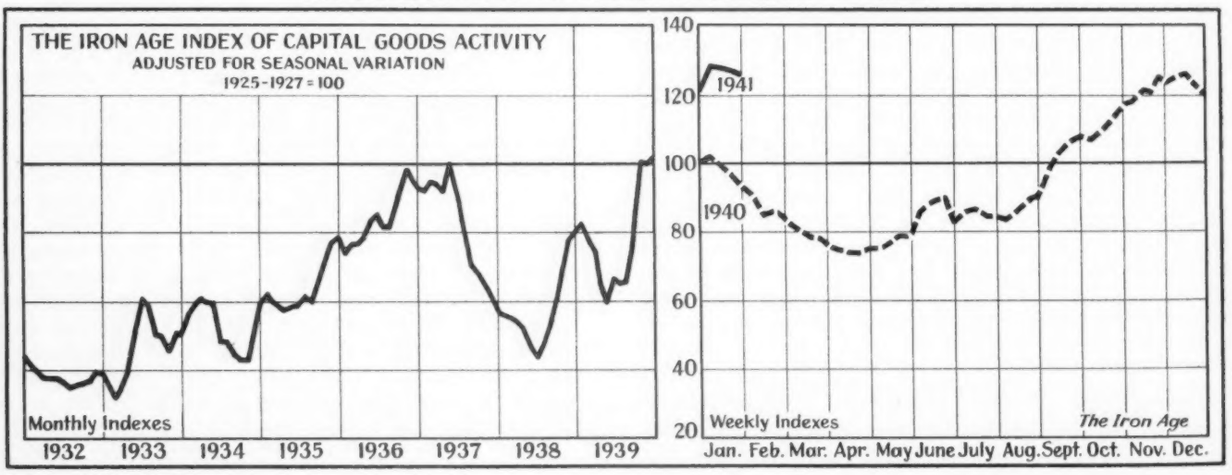
Repairs Reduce Steel Rate to 96%


STEEL INGOT PRODUCTION
(OPEN HEARTH AND BESSEMER)
PER CENT OF CAPACITY
Monthly Production
1932 1933 1934 1935 1936 1937 1938 1939
1941
1940
Weekly Production
The Iron Age
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
100 90 80 70 60 50 40 30 20 10 0

District Ingot Production, Per Cent of Capacity	Pitts-burgh	Chicago	Valleys	Phila-delphia	Cleve-land	Buffalo	Wheel-ing	Detroit	Southern	S. Ohio River	West-ern	St. Louis	East-ern	Aggre-gate
Current Week	98.0	98.0	98.0	98.0	89.0	104.5	85.0	100.0	94.0	107.0	102.5	105.5	99.0	96.0
Previous Week	99.0*	98.5	99.0	94.0	91.0	106.0	104.0	100.0	94.0	107.0	88.0	105.5	99.0	97.0

*Revised.

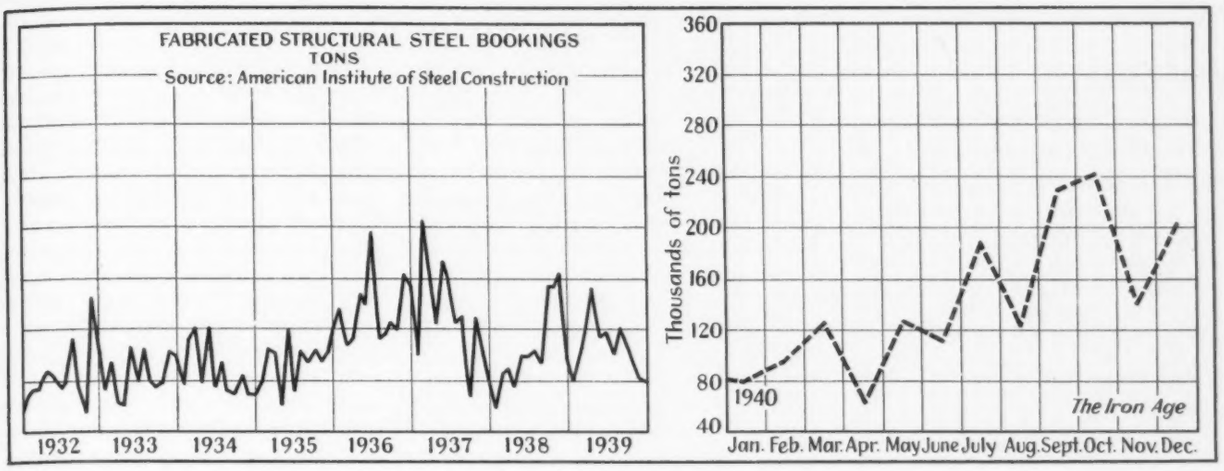
Index Lower For Third Successive Week


THE IRON AGE INDEX OF CAPITAL GOODS ACTIVITY
ADJUSTED FOR SEASONAL VARIATION
1925-1927 = 100
Monthly Indexes
1932 1933 1934 1935 1936 1937 1938 1939
1941
1940
Weekly Indexes
The Iron Age
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
140 120 100 80 60 40 20

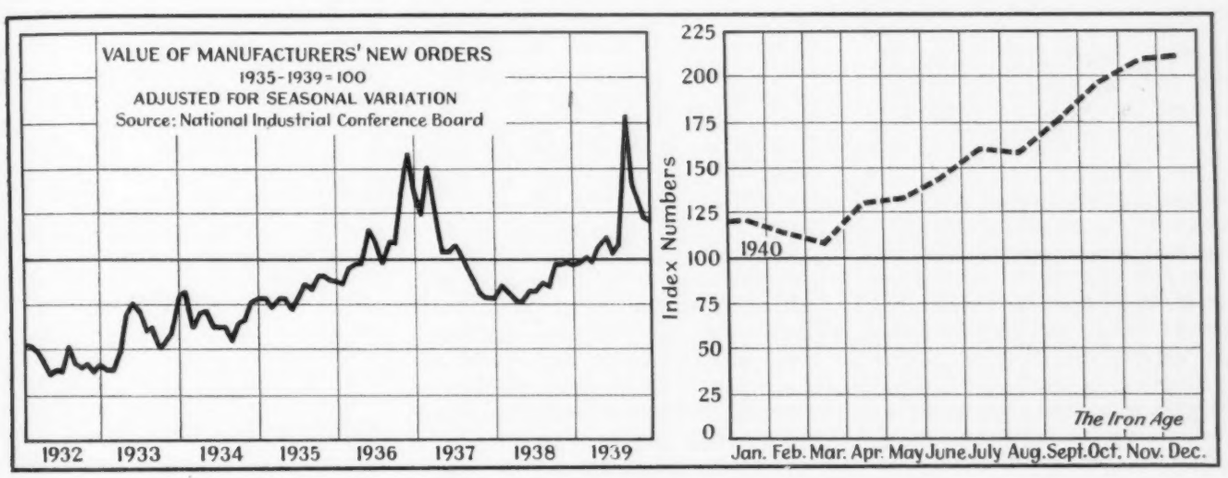
▼Component — Week Ended ➤	Feb. 1	Jan. 25	Jan. 4	Feb. 3 1940	Feb. 2 1929
Steel ingot production[1]	131.3	135.3	138.0	104.2	117.4
Construction contracts[2]	155.6	161.4	161.6	83.6	127.3
Automobile production[2]	132.6	130.5	106.3	107.9	137.6
Forest products carloadings[4]	79.4	79.3	67.7	56.6	120.3
Pittsburgh output and shipments[5]	128.5	128.4	128.9	109.0	117.7
COMBINED INDEX	125.5	127.0	120.5	92.3	124.1

Sources: [1] THE IRON AGE; [2] Wards Automotive Reports; [3] *Engineering News-Record*; [4] Association of American Railroads; [5] University of Pittsburgh. Indexes of forest products carloadings and activity in Pittsburgh area reflect conditions as of week ended Jan. 25. Other indexes cover week of Feb. 1.

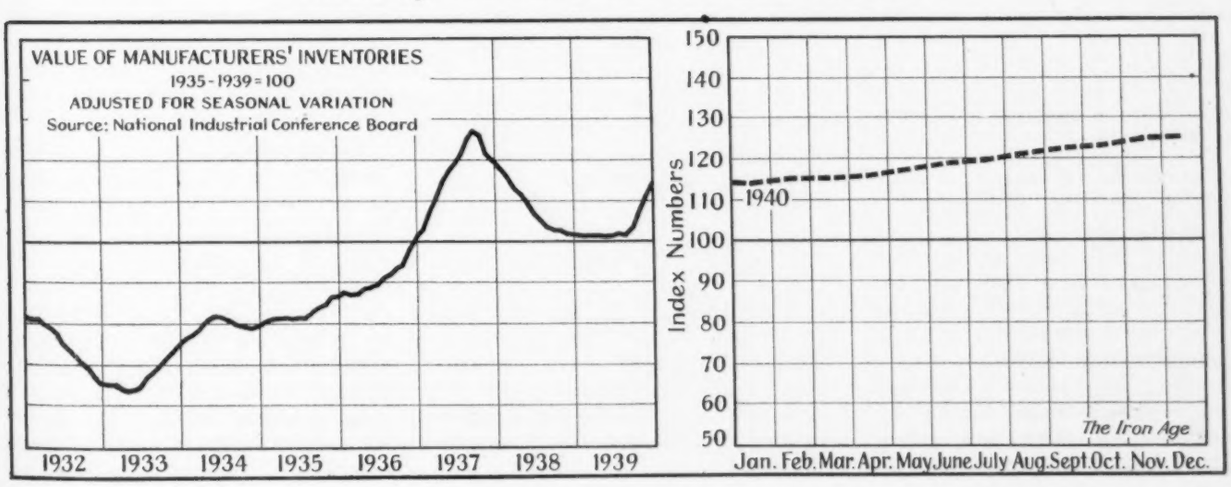
Fabricated Shape Bookings Rise 43%


FABRICATED STRUCTURAL STEEL BOOKINGS
TONS
Source: American Institute of Steel Construction
1932 1933 1934 1935 1936 1937 1938 1939
Thousands of tons
360 320 280 240 200 160 120 80 40
1940
The Iron Age
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

Manufacturers' Orders Heavier In December


VALUE OF MANUFACTURERS' NEW ORDERS
1935-1939=100
ADJUSTED FOR SEASONAL VARIATION
Source: National Industrial Conference Board
1932 1933 1934 1935 1936 1937 1938 1939
Index Numbers
225 200 175 150 125 100 75 50 25 0
1940
The Iron Age
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

Inventory Accumulation Remains Gradual


VALUE OF MANUFACTURERS' INVENTORIES
1935-1939=100
ADJUSTED FOR SEASONAL VARIATION
Source: National Industrial Conference Board
1932 1933 1934 1935 1936 1937 1938 1939
Index Numbers
150 140 130 120 110 100 90 80 70 60 50
1940
The Iron Age
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

Market News

. . . THE WEEK'S ACTIVITIES IN IRON AND STEEL

New Business

. . . Despite heavy bookings, most deliveries are "on time."

Some steel makers assert that steel priorities which are desired by neither the government nor the steel industry can be held in abeyance if steel makers and their consumers will give considerably more study to planning national defense projects in such a way that steel will reach the contractor or the fabricator when and as needed.

A study of several thousand steel commitments by a leading unit in the industry has disclosed that shipment was made "on time" in more than 85 per cent of the cases surveyed. This showing was made despite the fact that actual shipping dates were set up weeks previous to the time when the material left the mills and domestic material as well as governmental requirements was involved.

It is argued that by laying emphasis on actual shipping dates and sticking to the schedule, consumers could and will cooperate, thus reducing the number of cases where steel is shipped out on national defense projects long before conditions are ready for consumption or fabrication.

PITTSBURGH steel interests, as elsewhere, are asking consumer cooperation on the question of when material is actually needed to bring national defense projects to completion so that shipping schedules can be properly set up. PITTSBURGH reports no abatement in the flow of new business, with incoming volume running from 35 to 50 per cent above steel ingot production and backlogs remaining at three to four months.

New orders are ahead of shipments at CHICAGO, continuing to pile up backlogs and shove back deliveries. Mills there are turning down small orders that call for special treatment so that schedules are freed of interruptions as much as possible. With tin plate riding a new crest, all products are very strong. Sheets have moved up alongside bars, plates and structurals in heavy demand. Deliveries average about 10 weeks on all items at most mills—but certain sources quote some products all the way up to September, and July and August promises are common.

The past week saw an increase over the previous period in CHICAGO in fresh orders but one producer had less specifications at the mill. Customers' inventories average three to four months and all regular steel consumers are working at virtual capacity. Automotive interests are ordering intensively, farm implement makers are above seasonal levels with increasing volume of defense business in their plants. Future bookings are increasing, some fourth quarter requirements already accepted.

CLEVELAND and YOUNGSTOWN sellers of steel have experienced another week of heavy sales, practically all of the business being for extended shipment. At the same time, output of several of the principal production units in the two districts edged ahead of previous records.

The smaller integrated and non-integrated steel mills in Ohio are producing at full tilt and are booked solidly for weeks ahead. Demand from the automotive and container industries and requirements of government cantonments have been of particular benefit to the smaller steel producers recently.

New business continues to pour in at St. Louis, while sellers are endeavoring to separate those orders for which consumers already have projects under contracts and those being bought for business they expect to get, and therefore merely protective orders.

Orders for steel received during January are estimated at from 10 per cent to 20 per cent ahead of December bookings at two Buffalo mills. Another mill estimates a drop of about 10 per cent in new business booked during the same period.

Occasioned by the hesitancy of purchasers to buy for lengthened delivery, bookings have declined slightly at BIRMINGHAM. Most orders now are on a second quarter basis with price in effect at time of shipment.

With tinplate showing greater activity of late, the only product now on the inactive list in EASTERN PENNSYLVANIA is oil country pipe. Standard pipe, wire and nails are in heavy demand for cantonment building and general construction. Black and galvanized sheet deliveries and now in the third quarter and plates, in the case of two large producers, are in the same position. Bar business has shown faint signs of easing in some directions but deliveries are running into late June. Shipment of forgings and castings for marine construction are being quoted at six months and longer.

A lull in the appearance of new construction projects is noticeable in the San Francisco district, and some sources believe the peak in defense construction has been reached. A more common view, however, places it from 30 to 60 days away.

Pig Iron

. . . A Birmingham producer selling at $1 advance

One producer at BIRMINGHAM has sold a small tonnage of No. 2 foundry iron at an increase in price of $1 a ton. Future sales by this melter, one of the three major merchant iron producers in the BIRMINGHAM district, will be at the advanced price.

Little iron is being sold at CHICAGO since practically all output has been contracted for well in advance. Furnaces are at capacity and consumers are getting deliveries on time. There is no shortage in sight so long as operations continue on the present level.

Inquiries for low silicon pig iron at CLEVELAND continue to be heavy in volume.

Eastern Pennsylvania iron for first quarter delivery has been sold out, with the exception of very small tonnages sellers may be able to scrape up to meet emergency needs of consumers. Offerings for delivery in second quarter on the basis of prices in effect at time of shipment have been made by some sellers but buyers are reluctant to

accept iron unless a definite price is stipulated.

Merchant pig iron producers at Buffalo report there have been no holdups to date in shipments to regular customers. Completion of furnaces at the Hanna and Bethlehem plants soon will boost the Buffalo district's pig iron capacity to a new all-time high.

Movement of pig iron on contract in SOUTHERN OHIO has been becoming heavier and furnace interests indicate that the rate is now the largest since 1937.

Export inquiries at New York are finding little response among furnace representatives.

Semi-Finished Steel

. . . Shell steel orders add to heavy commitments

Steel makers at PITTSBURGH expect a substantial flow of shell steel business from the U. S. Army within the next 30 to 60 days, in addition to what is being placed in a normal fashion at this time. Demand for forging billets is heavy and specifications from the British Purchasing Commission for rerolling billets have improved considerably in volume during the past two weeks. Semi-finished capacity of all types is earmarked to the fullest extent for months to come.

Steel Operations

. . . Production declines slightly this week to 96 per cent

The fast pace at which steel making equipment has been utilized is taking a greater toll in necessary repairs. A decline of one point in ingot production this week to 96 per cent is caused almost wholly by shutdowns for repairs. There have been losses in six districts.

Most of the larger companies are operating slightly above or below 100 per cent, but in any case at virtually the limit of their practical capacity, but a survey by THE IRON AGE reveals that some of the smaller companies have some melting equipment still available for use. A better distribution of defense orders and reallocation of some business now on the books of the busier mills may bring all plants up to full operations within a short time.

The Bethlehem Steel Co. in January had the largest monthly production of ingots in its history. The total was 1,017,346 net tons, which was equal to 100.5 per cent of its present rated capacity. Previous record output was in October, 1940, when the total was 1,014,961 net tons.

Shipbuilding

. . . Western Pipe & Steel Co. to build ships

The Maritime Commission last week awarded a $5,980,000 contract to Western Pipe & Steel Co., San Francisco, for two C-3 cargo ships. The vessels will require a total of 7200 tons of steel.

The navy has awarded a contract to the Bristol Yacht Building Co., South Bristol, Me., for two minesweepers to cost $300,000.

Wire Products

. . . Special electric cable in demand for ships

A slight slackening recently in wire and wire product demand in PITTSBURGH a week ago has been followed by an order volume stronger in all lines. Manufacturers' wire order books reflects a stepup in general business conditions and demand for merchant wire products is steady. Full published prices are being obtained.

CLEVELAND reports unusually heavy orders for special electric cable from shipbuilders and the Navy. Backlogs in this line are at an all-time record and will keep capacity busy for months.

Tubular Goods

. . . Steady demand for pipe. Large sales of electric weld

Standard pipe sales are at a satisfactory level at PITTSBURGH and some signs of forward buying in oil country goods has been noted. National defense requirements insure a steady flow of merchant pipe business for several months.

Exceptionally brisk order volume has been coming to electric weld mills at CLEVELAND recently, the total last month exceeding output by a large margin.

Railroad Buying

. . . 1600 freight cars and 44 locomotives bought

A number of the inquiries which were reported in THE IRON AGE last week, have now been placed as orders. A total of 1585 freight cars, 44 locomotives, 8500 tons of rails and two streamlined trains were bought.

Chesapeake & Ohio has placed orders for 1095 freight cars as follows: 250 50-ton box cars each to American Car & Foundry Co., General American Transportation Corp., Pullman-Standard Car Mfg. Co., Mt. Vernon Car Mfg. Co., and 50 50-ton flat cars to Bethlehem Steel Co. Two 4-4-8 J3A passenger locomotives will be supplied by the Lima Locomotive Works and a new inquiry asks for 45 flat and well cars. Pere Marquette places 12 2-8-4 type freight locomotives with the Lima Locomotive Works and 40 cabooses with the St. Louis Car Co.

The Burlington bought 30 diesel-electric locomotives from the Electro-Motive Corp. and General Electric. Electro-Motive is to build four 2000-hp. passenger, 15 1000-hp. and six 600-hp. switching locomotives and General Electric five 360-hp. switchers. In addition to the order of 3325 cars reported in THE IRON AGE last week, this road has placed 250 ballast cars with American Car & Foundry.

Chicago & Northwestern completes its buying program by ordering 200 70-ton ore cars from Bethlehem.

Rail orders come from the Kansas City Southern and the Western Pacific totaling 8488 tons.

New York Central has asked authority to issue $10,900,000 in equipment trust certificates to finance the purchase of freight and passenger rolling stock costing $12,173,885. Other than the items mentioned in THE IRON AGE on Jan. 9, page 87, two complete all steel passenger trains consisting of 16 coaches each have now been ordered from Edward G. Budd Mfg. Co. The New Haven 1941 budget provides for the purchase of five electric locomotives, 10 diesel switchers, 1000 box cars, 25 cabooses, five grill cars and 23,400 tons of rails. Other pending purchases are 10 or 12 50-ton box cars for Santa Fe and a car barge for Western Pacific.

Sheets and Strip

Consumers covering for second and third quarters

A further spurt in sheet and strip buying is noted at PITTSBURGH which has pushed back deliveries further. Automotive sources remain the heaviest individual buyers but other flat rolled consumers are still clamoring to get on order books even though some mills are quoting second and third quarter shipments rather than specific dates. Orders for flat rolled material ultimately intended for national defense projects have increased somewhat in volume recently.

Demand for sheets and strip of all sizes is very heavy in the CHICAGO area. Most mills there have pushed back delivery promises. Hot rolled, 18 gage and heavier, is promised in early July while 20 gage and lighter is listed as early June; enameling iron in late June, the same as cold rolled; strip, 2½ in. and under, has been moved back to 14 to 16 weeks; galvanized sheets are 13 weeks.

Production of 86,000 tons of sheets, strip and plates by hot mills at one CLEVELAND continuous plant in January illustrates how the industry is responding to the present emergency. Cold mills at CLEVELAND also have been setting new plant records recently. Incoming orders are still numerous.

Sheet steel demand in the SOUTHERN OHIO district is mounting by leaps and bounds. The leading district interest reports heavy pressure for second quarter coverages, despite its reluctance to book steel too far in advance. Other interests in the area indicate that consumers are pressing for coverage to assure material in the second quarter. Some isolated instances of ordering for third quarter are also heard. Consumers are being booked for second quarter on the basis of their 1940 demand.

Warehouses in the South are buying galvanized sheets, as the early season brings a demand for material for work on the farms.

Plates

. . . Heavy demand and extended deliveries create tight situation

Tank makers, railroad carbuilders, machinery manufacturers and shipyards continue to yield heavy inquiries, according to sellers at CLEVELAND.

Plates are among the most active products at CHICAGO. One mill quotes most plate sizes for middle to late June delivery; another producer has extended deliveries of sheared plates in the 30 to 84 in. sizes to 13 to 14 weeks. The same delivery schedule applies to universal plates.

The supply situation in eastern Pennsylvania grows tighter as additional shipyard and railroad bookings for comparatively near delivery are added to already heavy backlogs of the same and to a sustained volume of miscellaneous demand. At two mills all tonnage possible has been squeezed into second

AMERICAN BONDED PRE-FINISHED METAL"

"Yes, we've got to speed up, eliminate lost motion . . . get rid of bottlenecks. Our answer is American Bonded Pre-Finished Metal. It stands to reason people who *specialize* in the finishing of metal can do it more efficiently and more cheaply than we. We can eliminate production detours and extra plating and polishing operations. Our whole production routine can be simplified. With your permission, gentlemen, I will ask a representative of this organization to call and discuss the use of their material."

NICKEL, CHROMIUM, BRASS OR COPPER
Electro-Bonded SHEETS · COILS
TO ZINC, STEEL, BRASS, COPPER, ALUMINUM OR TIN PLATE

AMERICAN NICKELOID COMPANY
1310 NORTH SECOND STREET . . . . PERU, ILLINOIS

quarter and other producers have nothing available before late June. An independent mill, heretofore able to give comparatively early delivery, has withdrawn from the market temporarily on sheared plate. Wide material is now running up to 30 weeks. Ship builders have specified for requirements far in advance, some of them running well into 1942. Tank makers have shown more activity of late.

The demand for plates continues strong in the ST. LOUIS area, with indications that some consumers are buying ahead to protect themselves against extended deliveries.

Warehouse Business

. . . Increasing demand for steel out of stock

Peak activity characterizes warehouse business in CHICAGO with mounting totals of business accumulating regularly. In fact, houses generally are eating into their stocks because sales are coming in faster than steel can be obtained from the mills.

CLEVELAND warehouses experienced a gain in volume during January compared with December. The amount of inquiry which normally would be directed to mills continues to increase. Difficulty has been encountered in attempting to satisfy some of these tonnage inquiries. Stocks are low in many products.

Warehouse business in St. Louis in December is estimated to be about 10 per cent ahead of November.

Warehouse business in the Philadelphia district during January held to the heavy volume of recent months. Business was generally heavier than in December and ran up to twice as much as January, 1940.

Reinforcing Steel

. . . Quantity extras on small lots revised upward

Some concrete bar makers have revised quantity extras on concrete reinforcing bars by establishing a 25c. a 100 lb. extra for orders less than 20 tons but not under five tons and 35c. a 100 lb. for orders less than five tons but not under one ton. Heretofore there was a 15c. a 100 lb. extra on orders less than 15 tons but not under five tons and a 25c. a 100 lb. extra on orders less than five tons but not under one ton. Extra on orders of less than one ton remains unchanged at 50c. a 100 lb. This action has not been taken by all major concrete bar makers as yet.

Reinforcing steel awards total 11,350 tons and include 2500 tons for fitting out piers at the Puget Sound Navy Yard, Bremerton, Wash.; 1527 tons for 201 igloos at Wilmington, Ill., and 1000 tons at Oakland, Cal., for a Navy airplane storage building.

New reinforcing steel projects call for 3125 tons. The largest inquiries are 1000 tons for U. S. Engineers, Huntington, W. Va., for a flood prevention project at Massillon, Ohio, and 1000 tons for underground magazines at Savanna, Ill.

Carry the Load with safety on

ABBOTT BEARING BALLS

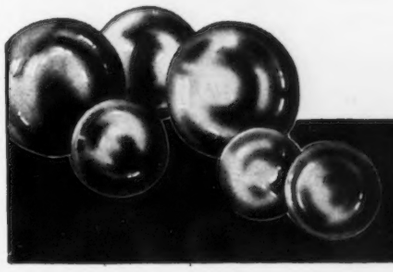
Easy-running bearings are the rule with Abbott steel balls in the assemblies. That applies to products having to cope with heavy loads and rough usage, as well as to higher speed bearings requiring closer tolerances.

Typical among industrial applications is this Standard Conveyor Company installation in an oil refinery. In the rolls of these storage and transfer lines, Abbott steel balls provide unfailing service.

The stamina of Abbott steel balls makes them a sound choice for heavy, medium, or light duty assemblies. Precision or commercial tolerances are available in a wide range of sizes.

The Abbott Ball Company

1047 New Britain Avenue
Hartford, Connecticut



Unseen in use yet always on the job

Structural Steel

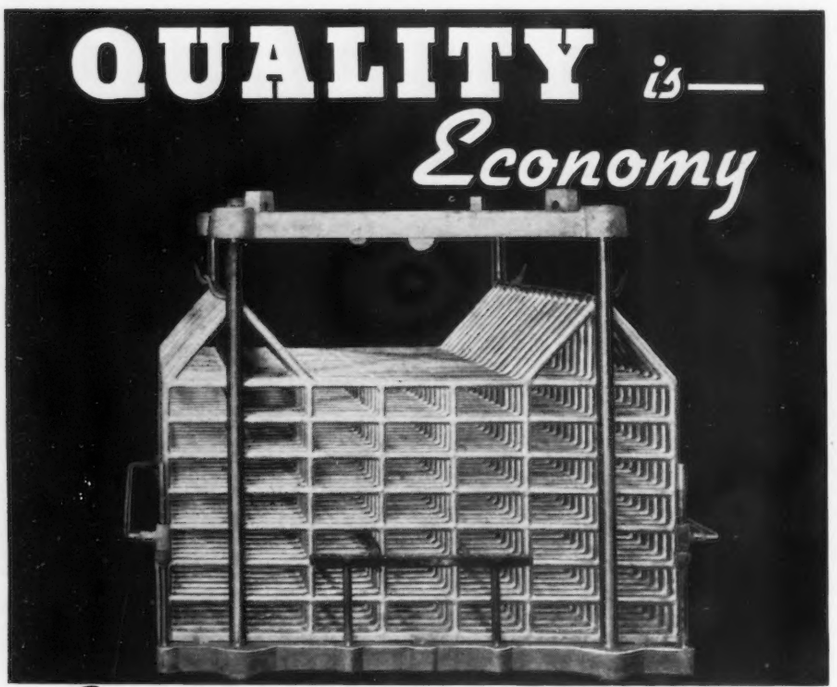
. . . Lettings of fabricated work total 34,450 tons

Fabricated structural steel lettings total 34,450 tons against 43,850 tons last week. Outstanding lettings include 9500 tons at Newark, N. J., for a building for the Prudential Life Insurance Co.; 4000 tons for bridge requirements in the second and third quarters for the Great Northern Railroad Co.; 2200 tons for hangars and hangar doors for the Army at various locations; 2000 tons for the Delco-Remy gun plant at Anderson, Ind., and 1500 tons at Philadelphia for an extension to the armor tempering plant of the Midvale Co.

New structural steel projects total 16,950 tons. Sizable inquiries are 10,000 tons for an ordnance plant at Denver; 3500 tons for the Thompson Products plant at Cleveland, which was previously reported as 800 tons; 3000 tons for relocating bridges for U. S. Engineers, Huntington, W. Va., for a flood prevention project at Massillon, Ohio; 2300 tons for a car storage and drive-away building for the Buick Motor Co., Flint, Mich.; 1800 tons at Burlington, N. J., for a power house for the Public Service Electric & Gas Co.; 1600 tons for a bridge at Ninth Street, Washington, over the Pennsylvania Railroad tracks; 1800 tons for power houses for the Pacific Gas & Electric Co. at three different locations, and 1200 tons for 137 underground magazines at Savanna, Ill.

It is understood Fort Pitt Bridge Works plans to reopen soon its plant at Massillon, Ohio, which has been closed for several months. A large backlog of work is assured for this plant, which normally employs about 200 persons.

Fabricating plants in the St. Louis industrial district are operating for the most part at from 75 to 80 per cent capacity, with defense projects predominating.



Grid type
TIN MILL PICKLING CRATE

The Patented Grids increase your production and eliminate seconds.

(Patent No. 1,858,430—Re-issue 17,882)

WRITE TODAY

Merchant Bars

. . . Longer deliveries now quoted as order books fill up

A heavy influx of specifications for cold finished bars within the past several weeks is being reflected in hot rolled bar order bookings at PITTSBURGH. Bar sales remain heavy to automotive interests and there has been no decline in the widely diversified requirements from other bar consumers. Total hot rolled bar business at PITTSBURGH in January was not up to December total but current order volume remains somewhat above bar capacity and shipments.

The defense program is responsible for the extremely heavy demand for carbon and alloy bars at Chicago. One producer announces that rounds, 3/8 in. to 55/64 in., can be delivered in September and the same mill promises the 7/8 in. to 3 1/16 in. rounds in June. Flats can be shipped in May, although the smaller and lighter flats are scheduled for August; and bar mill shapes are promised for May. However, most mills in that district are not quite as "tight" on these items.

Tin Plate

. . . Cold reduction mills operating at 85%

Cold reduction tin plate mills are again operating at 85 per cent this week with the trend definitely upward. Some mills are operating 20 turns a week. General line can demand is exceptionally strong, sanitary packers are stepping up their requirements and export sales are moderately heavier.

A sharp spurt in tin plate orders has developed at CHICAGO. The surge is in advance of the usual season, which may mean that buyers are buying earlier because of heavy defense demand. Six to eight weeks delivery is promised on tin plate by one mill.

"No Strikes" Pledged By Weirton Workers

• • • **Weirton Steel** employee representatives here who have been negotiating with the Weirton Steel Co. for increased wages and overtime pay, early this week pledged —"no strikes" and support of the defense program.

T. E. Millsop, president of Weirton Steel, in verifying the negotiations, said: "We have been in negotiation for some time but have not as yet arrived at definite decisions."

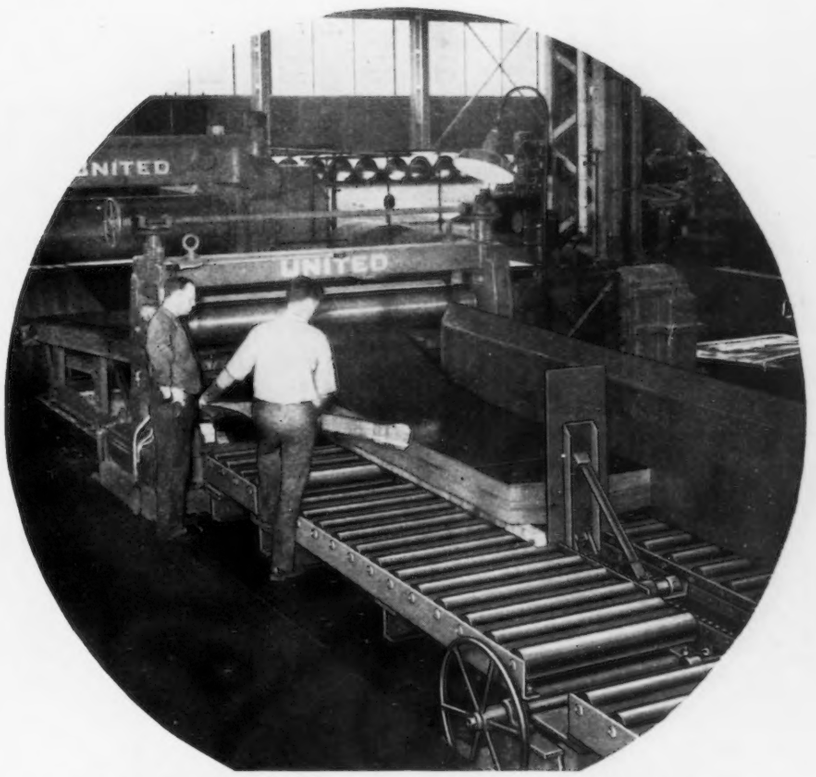
OPM Clarifies Defense Amortization Measure

Washington

Clarifying the provisions of the bill to extend the deadline date for filing applications for certificates under the defense amortization provisions of the excess profits tax law, the Office of Production Management advised manufacturers last week that the measure does not seek to extend indefinitely the time limit for filing applications.

The measure, which was signed by President Roosevelt last Saturday, was described by OPM as designed to "ease to a limited extent only the filing date requirements for manufacturers who have begun construction of new facilities since Dec. 8." The existing deadline is Feb. 5. Under the approved bill, a manufacturer who began construction on or before Dec. 8 must still make application for a certificate of necessity by Feb. 5, although the certificate would not have to be actually issued by that date, the OPM explained.

The new law provides that application must be made "before the expiration, or installation or the date of such acquisition, or before Feb. 6, whichever is later." For example, if a manufacturer begins construction before Dec. 8 he must file his application before Feb. 6, but if construction is begun after Dec. 8, he is permitted one day of grace for each day following the Dec. 8 date. If construction is begun on Dec. 9, for instance, application must be made before Feb. 7. If it is begun on Dec. 10, application must be made before Feb. 8 and so on.



"Stacking the Deck" —to win

● In the stacking or piling of sheets—and right down through this shearing line, Logan equipment links all operations into one continuous, profitable whole. *Your* shearing crews, too, can have an "ace in the hole" with Logan Conveyors, engineered to meet your specific requirements. Roll features: (1) Ruggedness, simplicity. (2) All-steel seals. (3) Outer shield stationary, set back from end of roll. (4) Hexagon shafts. Write for catalog or nearest engineer. LOGAN, 545 Cabel, Louisville, Ky.

Logan Conveyors

Machine Tools

. . . SALES, INQUIRIES AND MARKET NEWS

Demand Being Met By Expansions

Cleveland

• • • **Machine tool plant expansions** and strenuous efforts to line up subcontracting plants feature the market in this vicinity. Output here appears sufficient to preclude the possibility of any serious shortage for several more months on those items which are most urgently desired for the defense program. The pinch, if any, is not expected to come before August or September, but the chances are good that if present plans materialize for stepping up output no particular trouble may arise.

Reports from Washington indicate that there is still considerable confusion over priorities and export licenses.

Some foundries here are now turning out castings for several machine tool producers and apparently will lengthen their work week if arrangements can be made for bearing the extra cost.

One large foundry and machine shop in this city has undertaken to build a complete press for forming cartridges, a subcontract from a large national press builder.

Appointment of the new priorities committee, of which Dean Dexter S. Kimball will be impartial chairman, signifies an attempt to speed up the present setup at Washington.

Used machinery dealers, following a recent meeting at Washington, are cooperating by preparing lists of their stock. It is expected this will facilitate matters for buyers.

FROM THE Bluebook of Industry
REPEAT ORDERS for WELLS SAWS
RESULTS—accurate, dependable, day-in and day-out sawing—that's what brings repeat orders for Wells Metal Cutting Band Saws. Wells Saws feature simplicity, ease of operation, long-wearing parts. For continuous production or the 1001 miscellaneous metal cutting jobs around any plant, you'll be money ahead to buy Wells Saws now!
Every one of these firms has tried WELLS Metal Cutting Band Saws and come back for more!
Aluminum Company of America
American Steel Foundries
Baldwin Locomotive Works
Bethlehem Steel Corporation
Buick Motor Division, Gen'l Motors
Chase Brass & Copper Co.
E. I. Du Pont de Nemours & Co.
Erie Railroad Company
Loose Wiles Biscuit Co.
Magnus Metal Div. of Nat'l Lead Co.
Peoples Gas Light & Coke Co., Chicago
Proctor and Gamble
R. C. A. Mfg. Co., Inc.
Sherwin-Williams Co.
Superior Iron Works
Union Pacific Coal Co.
United States Rubber Co.
Waltham Watch Co.
Western Electric Co.
. . . and dozens of others!
Now Built in 3 Sizes
No. 5—5" dia. round or 5" x 10" flat.
No. 8—8" dia. round or 8" x 16" flat.
No. 12—12" dia. round or 12" x 16" flat.
Also the No. 9 Upright Saws.
Nos. 5, 8, 9 available for immediate delivery!
WELLS METAL CUTTING BAND SAWS
WELLS MFG. CORP.
Three Rivers, Mich.

Worker Problems Being Solved

Cincinnati

• • • **While the industry** could use more skilled men were they available, machine tool builders are breathing a trifle easier over two problems that caused some disturbance heretofore. The construction of a new Wright motor plant in this area, which is estimated ultimately to employ some 14,000 or 15,000 men, has caused a great deal of concern in the machine tool industry over the possibiiity that this new plant may pull men away from their regular forces. Frequent conferences between the personnel department of the new plant and local manufacturers of machine tools have brought about an understanding which, combined with Wright's prosecution of a rather thorough training program in anticipation of the completion of the plant, has brought a measure of relief from this source. Secondly, following a conference of machine tool officials and government draft officials last week, it appears now that the concern over the Army depleting skilled forces has been greatly diminished.

Auto Firms Out of Market

Detroit

• • • **The position of the automobile** industry in regard to purchases of machine tools is concisely summed up in a statement released Jan. 31 by the Automobile Manufacturers Association. "Insofar as production of motor vehicles is concerned, the automobile industry is not in the market for new tools, and the establishment of priorities on machine tool deliveries, as announced today, will not materially affect either 1941 or 1942 models."

The AMA statement calls attention to the fact that automotive companies have on order and are obtaining delivery right along on a very large number of machine tools for execution of defense contracts, including those for airplane engines, tanks, machine guns, shells, and military cars and trucks.

Non-Ferrous Metals

. . . MARKET ACTIVITIES AND PRICE TRENDS

NEW YORK, Feb. 4—Outstanding feature of the non-ferrous markets in the past week was the purchase of 100,000 tons of Latin-American copper by the Metals Reserve Co., bringing the total of such purchases to 200,000 tons. Deliveries will approximate 25,000 tons a month, starting in March. Not much change was noted in regular markets during the week. Lead demand was a little better, and tin prices were higher as a result of higher freight rates. Zinc and copper producers allocated good tonnage.

News of the government copper purchase resulted in some lessening of pressure by consumers in the custom smelter market, but there remained a fair volume of business done on the basis of 12.50c. a lb. for shipment in the current month. Mine producers continued to ask 12c. for electrolytic material, delivered Valley. Some export transactions were closed at from 10.375 to 10.50c. a lb., f.a.s.

Lead

The volume of transactions going into the books in the past week was again fairly heavy and all sellers were able to equal or better their intake quotas on a weekly basis. Most of the business involved the March position and the end of the week saw buyers' requirements for that month about 30 per cent covered, while only 10 per cent of the current month's needs remained to be filled.

Tin

Announcement during the week of an increase in freight rates from the Far East, to go into effect March 1, which will raise import costs about 40c. a 100 lb., immediately raised the domestic market for prompt Straits metal to 50.50c. a lb., New York, on Friday. Futures went to 50.25c. to 50.375c. Buying reaction to the increase was slight, however, since shipments to this country are now almost double the rate of consumption and consumers are not anxious about supplies. Sellers were not interested in doing any further business at the government buying level for the present and the market entered a quieter stage.

Zinc

Completion of appointments to the governments priorities committee for the non-ferrous metal industries during the past week brought closer the long expected means of control over an unsatisfactory supply situation in the zinc trade. In the meantime, interest centered around the attention being given at the present time to the scrap and secondary smelter market. In the regular market during the week sellers followed the established routine of allocating tonnages. Prime Western was firm at 7.64c. a lb., delivered New York.

Aluminum

Production in 1940 of 412,560,000 lb. of aluminum was the highest on record. The past year's output was 26 per cent higher than the previous high, 327,090,000 lb. reached in 1939.

January Averages

Average prices of the major non-ferrous metals in January, based on quotations appearing in THE IRON AGE, were as follows:

	Per Lb.
Electrolytic copper, Conn. Valley	12.00c.*
Lake copper, Eastern delivery	12.00c.
Straits tin, spot, New York	50.16c.
Zinc, East St. Louis	7.25c.
Zinc, New York	7.64c.
Lead, St. Louis	5.35c.
Lead, New York	5.50c.

*Mine producers only.

(Non-ferrous prices on page 119)

THE "FIFTH COLUMNIST" OF METALS...

RUST

Protect iron and steel parts between operations, in storage or in transit...with Houghton's

RUST-VETO

These are a new, proven series of rust preventives every type, to meet every problem. Write for descriptive folder.

E. F. HOUGHTON & CO.
Third and Somerset Streets
Chicago - PHILADELPHIA - Detroit

Scrap . . . MARKET ACTIVITIES AND QUOTATION TRENDS

• • • **Last Friday** the Institute of Scrap Iron and Steel sent a telegram to its members stating that leading railroads and the defense commission had agreed that $21 a ton, Pittsburgh, "will not be considered unduly high" on February bids to the railroads. In January the limit was set at $22, a drop of $1.

It was also stated in this telegram that $26, Pittsburgh, for rerolling rails and $24, Pittsburgh, on scrap rails will not be considered unduly high. This is an increase of $1 a ton on rerolling rails which is to defray railroads' additional cost in sorting them from scrap rails, which are to be made available for foundries.

This action comes much closer to actual price fixing than was assumed from the defense commission's previous "suggestions" on prices.

At Pittsburgh, where No. 1 heavy melting steel is usually quoted at 50c. or more a ton below railroad heavy melting steel, no such differential can be established this week on the basis of transactions, so the two grades are quoted at the same level, an anomalous situation. Unless differentials for other districts are established sufficiently below the Pittsburgh level, that district may run short of scrap because it must draw some of its supply from outside its immediate confines. In several districts heavy melting scrap is down 50c. this week. THE IRON AGE scrap composite has declined to $20.17, a total drop of $1.83 since the first week of January.

A survey made for the Institute of Scrap Iron and Steel reveals that in 19 states remote from steel making centers, approximately 300,000 tons of automobile body and fender scrap is lying dormant and corroding. This survey was conducted by Herman E. Krulewitch of Simon Krulewitch, Inc., 1137 S. Washtenaw Avenue, Chicago. Owing to high freight rates from points of origin to consuming centers, special steps would probably have to be taken to bring this scrap to market.

Pittsburgh

For the past several days the scrap market in Pittsburgh as it pertains to primary grades such as No. 1 and No. 2 heavy melting steel has been at a virtual standstill. The fact that other scrap markets outside of the Pittsburgh district are quoting prices on No. 1 and No. 2 steel at or close to the nominal quotations here has completely stopped the flow of such material to the Pittsburgh district. Yard supplies here are almost exhausted and small scrap collectors in many cases have sought more lucrative employment. For the time being at least there appears to be little or no primary scrap obtainable at current figures except from railroad lists where governmental pressure has been exerted. Some scrap buyers are even more worried about current conditions than scrap brokers. No. 1 railroad heavy melting is quotable this week at $21 to $21.50, down $1 a ton from last week's quotation. Ordinarily dealers No. 1 heavy melting scrap is quotable at a differential amounting to at least 50c. a ton below railroad heavy melting, but inasmuch as there has been no transactions involving ordinary No. 1 heavy melting in this district during the past several days, there is as yet no basis for establishing quotations on this grade below the price of railroad heavy melting. Consequently, No. 1 heavy melting steel is nominally quoted the same as railroad heavy melting at $21 to $21.50, down 25c. from last week's average. When and if enough transactions have been consummated to establish some kind of a new quotation on No. 1 heavy melting steel, such transactions will be taken as a guide. Railroad scrap rails are quoted at a flat $24 a ton, which is up from last week's quotation and reflects the price established at Washington.

Chicago

No. 1 heavy melting steel dropped this week 50c. to a level of $19 to $19.50. Cast, blast furnace and electric furnace items held up in the face of extreme activity on the part of foundries and other interests. Rails are coming out in greater numbers and spring is expected to release a greater flow in this direction. Although there is no shortage of material, a slight indication of some "freezing" is evident since there is no blinking the fact that generally scrap is not coming out very fast.

Philadelphia

Fresh consumer buying was not much in evidence in the past week and prime steel making grades remained unchanged. Old bundles were quoted at $17 flat and cast borings at $16. Bad weather has caused shipments to fall off as much as 25 per cent recently. Supplies are none too plentiful and cast scrap is getting more difficult to obtain.

Youngstown

No. 1 heavy melting steel is quoted here this week at $21 to $21.50 per ton, a decline of 50c., in line with a sale into mill consumption last week. Shipments have been temporarily cut back at one or two points in the Valley.

Cleveland

The market continues in the doldrums here. In line with declines over the nation, No. 1 heavy melting steel is now quoted at $20 to $20.50, down 50c. Mills report that a very satisfactory amount of material is now coming out. Some foundries, however, are still experiencing difficulty obtaining certain grades.

Buffalo

With announcement of railroad prices, No. 1 heavy melting scrap dropped 50c. here to a range of $20.50 to $21 a ton with some dealer sales reported early this week within that range. Brokers, however, are inclined to the belief that within another week to 10 days No. 1 heavy melting steel will be quoted here at $20 to $20.50 a ton. There have been no mill sales reported here for the last month. Cast scrap is very strong and supplies are dwindling.

Birmingham

Sustained high operating rate at pipe shops here, largely due to heavy government orders, continues to require large tonnages of cast grades and movement of all scrap items has substantially increased. Prices for heavy melting steel remain uncertain.

Detroit

Notification by New York Central Railroad to scrap dealers by mail that no bids over $21 would be accepted has thrown prices into a swirl that makes it extremely difficult to gage this week's level. Automotive lists which closed at the end of January were off $1.50 and in one case, off $3 from the price level of a month ago. However, since the first of the week there has been a tendency to take into account the effect of the $21 price on railroad scrap and to anticipate its effect.

New York

The spread in dealers' bids for No. 1 has been narrowed to 50c. from a former $1, and the market appears to be largely adjusted to the new price level. Cast grades continue in heavy demand. Export quotations on No. 1 and No. 2 steel are 50c. lower.

Boston

Hardly enough business is being transacted to establish prices. The market for steel turnings and blast furnace material is slightly lower, but prices otherwise have not changed.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$21.00 to $21.50
Railroad heavy mltng.	21.00 to 21.50
No. 2 heavy melting	19.50 to 20.00
Railroad scrap rails	.... 24.00
Comp. sheet steel	21.00 to 21.50
Hand bundled sheets	20.00 to 20.50
Heavy steel axle turn.	20.00 to 20.50
Heavy steel forge turn.	19.00 to 19.50
Machine shop turnings	15.50 to 16.00
Short shov. turn. alloy free	16.00 to 16.50
Mixed bor. & turn.	15.50 to 16.00
Cast iron borings	16.00 to 16.50
Cast iron carwheels	22.00 to 22.50
Heavy breakable cast.	17.50 to 18.00
No. 1 cupola cast	22.00 to 22.50
RR. knuckles & coup.	26.50 to 27.00
Rail coil springs	27.00 to 27.50
Rail leaf springs	27.00 to 27.50
Rolled steel wheels	27.00 to 27.50
Low phos. billet crops	27.00 to 27.50
Low phos. punchings	26.00 to 26.50
Low phos. heavy plate	25.50 to 26.00
Railroad malleable	25.50 to 26.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	.... $20.00
No. 2 hvy. mltng. steel	.... 18.50
Hydraulic bund., new	.... 20.00
Hydraulic bund., old	.... 17.00
Steel rails for rolling	$25.00 to 26.00
Cast iron carwheels	.... 23.00
Hvy. breakable cast	22.00 to 22.50
No. 1 cupola cast	23.50 to 24.00
Mixed yard (f'd'y) cast	.... 20.50
Stove plate (steel wks.)	19.00 to 19.50
Railroad malleable	23.50 to 24.00
Machine shop turn	.... 14.50
No. 1 blast furnace	.... 14.00
Cast borings	.... 16.00
Heavy axle turnings	.... 19.50
No. 1 low phos. hvy.	26.00 to 26.50
Couplers & knuckles	26.00 to 26.50
Rolled steel wheels	26.00 to 26.50
Steel axles	25.00 to 25.50
Shafting	25.00 to 25.50
Spec. iron & steel pipe	18.00 to 18.50
Cast borings (chem.)	.... 16.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel	$19.00 to 19.50
Auto. hvy. mltng. steel alloy free	18.00 to 18.50
No. 2 auto. steel	16.00 to 16.50
Shoveling steel	19.00 to 19.50
Factory bundles	18.50 to 19.00
Dealers' bundles	17.00 to 17.50
No. 1 busheling	18.00 to 18.50
No. 2 busheling, old	11.50 to 12.00
Rolled carwheels	23.00 to 23.50
Railroad tires, cut	22.50 to 23.00
Railroad leaf springs	23.00 to 23.50
Steel coup. & knuckles	23.00 to 23.50
Axle turnings	18.25 to 18.75
Coil springs	24.00 to 24.50
Axle turn. (elec.)	19.75 to 20.00
Low phos. punchings	23.00 to 23.50
Low phos. plates 12 in. and under	22.50 to 23.00
Cast iron borings	13.50 to 14.00
Short shov. turn	14.00 to 14.50
Machine shop turn	13.50 to 14.00
Rerolling rails	23.00 to 23.50
Steel rails under 3 ft.	23.00 to 23.50
Steel rails under 2 ft.	23.50 to 24.00
Angle bars steel	22.50 to 23.00
Cast iron carwheels	20.50 to 21.00
Railroad malleable	24.25 to 24.75
Agric. malleable	17.50 to 18.00
	Per Net Ton
Iron car axles	$23.50 to $24.00
Steel car axles	24.00 to 24.50
Locomotive tires	18.00 to 18.50
Pipes and flues	14.00 to 14.50
No. 1 machinery cast	18.50 to 19.00
Clean auto. blocks	18.00 to 18.50
No. 1 railroad cast	17.50 to 18.00
No. 1 agric. cast	16.50 to 17.00
Stove plate	13.00 to 13.50
Grate bars	14.00 to 14.50
Brake shoes	14.25 to 14.75

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$21.00 to $21.50
No. 2 hvy. mltng. steel	19.50 to 20.00
Low phos plate	24.00 to 24.50
No. 1 busheling	20.00 to 20.50
Hydraulic bundles	20.50 to 21.00
Machine shop turn	14.00 to 14.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$20.00 to $20.50
No. 2 hvy. mltng. steel	19.00 to 19.50
Comp. sheet steel	$19.50 to $20.00
Light bund. stampings	16.00 to 16.50
Drop forge flashings	18.00 to 18.50
Machine shop turn	13.00 to 13.50
Short shov. turn	13.50 to 14.00
No. 1 busheling	19.25 to 19.75
Steel axle turnings	19.50 to 20.00
Low phos. billet and bloom crops	24.50 to 25.00
Cast iron borings	13.50 to 14.00
Mixed bor. & turn	13.50 to 14.00
No. 2 busheling	13.50 to 14.00
No. 1 machinery cast	21.50 to 22.00
Railroad cast	21.00 to 21.50
Railroad grate bars	15.00 to 15.50
Stove plate	15.00 to 15.50
Rails under 3 ft.	24.50 to 25.00
Rails for rolling	25.50 to 26.00
Railroad malleable	24.00 to 24.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$20.50 to $21.00
No. 2 hvy. mltng. steel	18.50 to 19.00
Scrap rails	21.00 to 21.50
New hvy. b'ndled sheets	18.00 to 18.50
Old hydraul. bundles	16.50 to 17.00
Drop forge flashings	18.00 to 18.50
No. 1 busheling	18.00 to 18.50
Machine shop turn	$13.50 to 14.00
Shov. turnings	15.00 to 15.50
Mixed bor. & turn	13.50 to 14.00
Cast iron borings	13.50 to 14.00
Knuckles & couplers	25.00 to 25.50
Coil & leaf springs	25.00 to 25.50
Rolled steel wheels	25.00 to 25.50
No. 1 machinery cast	21.00 to 21.50
No. 1 cupola cast	19.50 to 20.00
Stove plate	17.00 to 17.50
Steel rails under 3 ft.	26.50 to 27.00
Cast iron carwheels	18.50 to 19.50
Railroad malleable	23.50 to 24.00
Low phos. plate	27.00 to 27.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	$18.00 to $18.50
No. 1 hvy. melting	17.50 to 18.00
No. 2 hvy. melting	16.50 to 17.00
No. 1 locomotive tires	19.50 to 20.00
Misc. stand. sec. rails	19.50 to 20.00
Railroad springs	21.50 to 22.00
Bundled sheets	13.00 to 13.50
Cast bor. & turn	11.00 to 11.50
Machine shop turn	11.25 to 11.75
Heavy turnings	13.50 to 14.00
Rails for rerolling	22.00 to 22.50
Steel car axles	25.00 to 25.50
No. 1 RR wrought	14.00 to 14.50
No. 2 RR. wrought	16.50 to 17.00
Steel rails under 3 ft.	23.50 to 24.00
Steel angle bars	21.25 to 21.75
Cast iron carwheels	21.00 to 21.50
No. 1 machinery cast	19.50 to 20.00
Railroad malleable	20.00 to 21.00
Breakable cast	17.50 to 18.00
Stove plate	15.00 to 15.50
Grate bars	14.00 to 14.50
Brake shoes	13.50 to 14.00

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel	$18.25 to $18.75
No. 2 hvy. mltng. steel	16.25 to 16.75
Scrap rails for mltng.	23.25 to 23.75
Loose sheet clippings	12.75 to 13.25
Hyd'lic bundled sheets	17.00 to 17.50
Cast iron borings	9.25 to 9.75
Machine shop turn	10.00 to 10.50
No. 1 busheling	14.25 to 14.75
No. 2 busheling	7.75 to 8.25
Rails for rolling	24.50 to 25.00
No. 1 locomotive tires	20.25 to 20.75
Short rails	26.25 to 26.75
Cast iron carwheels	18.75 to 19.25
No. 1 machinery cast	22.25 to 22.75
No. 1 railroad cast	20.50 to 21.00
Burnt cast	12.75 to 13.25
Stove plate	12.75 to 13.25
Agricul. malleable	18.00 to 18.50
Railroad malleable	21.00 to 21.50
Mixed hvy. cast.	19.25 to 19.75

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting steel	.... $18.00
No. 2 hvy. melting steel	.... 17.00
No. 1 busheling	.... 16.00
Scrap steel rails	.... 18.00
Steel rails under 3 ft.	.... 20.00
Rails for rolling	.... 19.00
Long turnings	.... 9.50
Cast iron borings	.... 8.50
Stove plate	.... 13.50
Steel axles	.... 18.00
No. 1 RR. wrought	.... 16.00
No. 1 cast	.... 18.50
No. 2 cast	.... 13.50
Cast iron carwheels	.... 19.00
Steel carwheels	.... 18.00

DETROIT

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 heavy melting	$16.25 to $16.75
No. 2 heavy melting	15.25 to 15.75
Borings and turnings	11.25 to 11.75
Machine shop turnings	10.75 to 11.25
Long turnings	9.75 to 10.25
Short shov. turnings	11.75 to 12.25
No. 1 cast	19.50 to 20.00
Automotive cast	19.50 to 20.00
Hvy. breakable cast	16.00 to 16.50
Stove plate	11.50 to 12.00
Hydraul. comp. sheets	17.75 to 18.25
New busheling	16.25 to 16.75
Sheet clips	13.75 to 14.25
Flashings	16.25 to 16.75
Low phos. plate	18.50 to 19.00

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel	.... $16.00
No. 2 hvy. mltng. steel	$14.50 to 15.00
Hvy. breakable cast	18.00 to 18.50
No. 1 machinery cast	18.50 to 19.00
No. 2 cast	16.50 to 17.00
Stove plate	15.00 to 15.50
Steel car axles	23.00 to 23.50
Shafting	19.50 to 20.00
No. 1 RR wrought	17.50 to 18.00
No. 1 wrought long	17.00 to 17.50
Spec. iron & steel pipe	12.00 to 12.50
Rails for rolling	19.00 to 19.50
Clean steel turnings*	10.00 to 10.50
Cast borings*	11.00 to 11.50
No. 1 blast furnace	9.00 to 9.50
Cast borings (chem.)	11.00 to 11.50
Unprepared yard scrap	9.50 to 10.00
Light iron	7.00 to 7.50

Per gross ton delivered local foundries:

No. 1 machin. cast	$20.50 to $21.00
No. 2 cast	17.00 to 17.50

* $1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

Breakable cast	$16.75 to $17.00
Machine shop turn	9.00 to 9.50
Mixed bor. & turn	8.25 to 9.00
Bun. skeleton long	13.00 to 13.25
Shafting	19.00 to 19.50
Stove plate	13.75 to 14.00
Cast bor. chemical	10.00 to 10.50

Per gross ton delivered consumers' yards:

Textile cast	$22.00 to $24.50
No. 1 machine cast	22.00 to 24.00

Per gross ton delivered dealers' yards:

Unprepared yard scrap	$11.50 to 12.50

PACIFIC COAST

Per net ton delivered to consumer:

	San Fran.	Los Ang.	Seattle
No. 1 hvy. mltng. steel	Nominal		
No. 2 hvy. mltng. steel			
Bundles			

CANADA

Dealers' buying prices at these yards, per gross ton:

	Toronto	Montreal
Low phos. steel	$13.00	$12.50
No. 1 hvy. mltng. steel	11.25	10.75
No. 2 hvy. mltng. steel	10.00	9.75
Mixed dealers steel	8.75	8.25
Drop forge flashings	9.75	9.25
New loose clippings	8.75	8.25
Busheling	6.00	5.50
Scrap pipe	7.75	7.25
Steel turnings	8.00	7.50
Cast borings	8.00	7.50
Machinery cast	22.00	21.00
Dealers' cast	21.00	20.00
Stove plate	16.00	15.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered barges

No. 1 hvy. mltng. steel	$16.00 to $16.50
No. 2 hvy. mltng. steel	15.00 to 15.50
No. 2 cast	17.00 to 17.50
Stove plate	15.00 to 16.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel	.... $17.25
No. 2 hvy. mltng. steel	.... 16.25
Rail (scrap)	$17.25 to 17.50

Philadelphia, delivered alongside boats, Port Richmond

No. 1 hvy. mltng. steel	Nominal
No. 2 hvy. mltng. steel	Nominal

Construction Steel

. . . STRUCTURAL STEEL, REINFORCING BARS, PLATES, PILING, ETC.

Fabricated Steel

Structural steel lettings again are lower at 30,450 tons against 43,850 tons last week; new projects declined to 26,950 tons from 29,750 tons a week ago; plate awards total 4930 tons.

AWARDS

NORTH ATLANTIC STATES

9500 Tons, Newark, N. J., Prudential Life Insurance Co. building, to Harris Structural Steel Co., Plainfield, N. J.

1500 Tons, Philadelphia, extension to armor-tempering plant, Midvale Steel Co., to Bethlehem Steel Co., Bethlehem, Pa.

700 Tons, Pittsburgh, lamp plant for Westinghouse Electric & Mfg. Co., to Ingalls Iron Works Co., Pittsburgh plant.

540 Tons, New York, tuberculosis pavilion at Riverside Hospital in Bronx, to Harris Structural Steel Co., Plainfield, N. J.

375 Tons, Camden, N. J., launchway girders for New York Shipbuilding Corp., to American Bridge Co., Pittsburgh.

350 Tons, Coatesville, Pa., Lukens Steel Co. expansion, to Belmont Iron Works, Philadelphia, through Arthur G. McKee & Co., Cleveland.

315 Tons, Bowmansville, N. Y., State highway bridge, to Bethlehem Steel Co., Buffalo, through Ellis G. Dehlia, New Hartford, N. Y.

300 Tons, Johnstown, Pa., dairy and ice cream plant, to Griffith Custer Co., Johnstown.

300 Tons, Worcester, Mass., Worcester Polytechnic Institute mechanical engineering building, to Stafford Iron Works, Worcester, Mass.

300 Tons, Pittsburgh, Sears-Roebuck & Co. store, to Bethlehem Steel Co., Bethlehem, Pa.

200 Tons, Quonset Point, R. I., cold storage building, project 37, to Belmont Iron Works, Philadelphia.

160 Tons, New York, New York Central viaduct, 11th Avenue, to Bethlehem Steel Co., Bethlehem, Pa.

130 Tons, Warren County, Pa., Pennsylvania State highway bridge, route 89, to Fort Pitt Bridge Works Co., Pittsburgh.

100 Tons, Quonset Point, R. I., boat house, project 40, to Belmont Iron Works, Philadelphia.

THE SOUTH

829 Tons, Emco, Ala., two furnace buildings for Electro Metallurgical Corp., to Ingalls Iron Works Co., Birmingham and Pittsburgh plants.

750 Tons, Grand Prairie, Tex., land plane hangar and shops, Hinsley Field; 600 tons to Mosher Steel Co., Dallas, Tex., 150 tons to Austin Brothers, Dallas.

200 Tons, Camp Shelby, Miss., miscellaneous construction for War Department, to Ingalls Iron Works Co., Birmingham.

150 Tons, Bogalusa, La., bag factory for Gaylord Container Corp., to Ingalls Iron Works Co., Pittsburgh plant.

CENTRAL STATES

2000 Tons, Anderson, Ind., Delco-Remy gun plant to Indiana Bridge Co., Muncie, Ind.

360 Tons, Cincinnati, building for American Tool Works, to International Steel Co., Evansville, Ind.

300 Tons, Detroit, factory for Bohm Aluminum & Brass Co., to Jones & Laughlin Steel Corp., Pittsburgh.

250 Tons, East Chicago, Ind., buildings for Sinclair Oil Co., to Hansell-Elcock Co., Chicago.

220 Tons, Harrisburg, Ill., pumping stations, to Laclede Steel Co., St. Louis.

135 Tons, Delhi, Ohio, beams for gate tracks for War Department, to American Bridge Co., Pittsburgh.

120 Tons, Flint, Mich., storage building for Buick Motor Co., to Flint Structural Steel Co., Flint.

118 Tons, Oberlin, Ohio, physics and biology buildings, to Ingalls Iron Works Co., Birmingham.

WESTERN STATES

4000 Tons, various locations, bridge requirements for Great Northern Railroad, second and third quarters, 1941, to American Bridge Co., Pittsburgh.

2200 Tons, various points, hangars and hangar doors for Army air fields, to Consolidated Steel Corp., Los Angeles.

900 Tons, Seattle, Sand Point Naval Air Base buildings, to Pacific Car & Foundry Co., Seattle, through Austin Co., Seattle, contractor.

700 Tons, Adams City, Col., State bridges, to American Bridge Co., Pittsburgh.

526 Tons, Azusa, Cal., State undercrossing, to Consolidated Steel Corp., Los Angeles, through J. E. Haddock, Ltd., Pasadena, Cal., contractor.

500 Tons, Portland, Ore., Oregon Shipbuilding Co. yards, to Isaacson Iron Works, Seattle.

424 Tons, Terminous, Cal., State bridge and trestle, to Minneapolis-Moline Power Implement Co., Los Angeles, through Tavares Construction Co., Los Angeles, contractor.

400 Tons, Mare Island, Cal., Navy Yard administration building, to Herrick Iron Works, Oakland, Cal.

400 Tons, Bremerton, Wash., Puget Sound Navy Yard warehouse (Specification 10240), to Willamette Iron & Steel Corp., Portland, Ore., through H. R. Olson, Tacoma, Wash., contractor.

CANAL ZONE

151 Tons, Coco Solo, net and boom building for government, through Swinerton, Hegeman & McClure, to Ingalls Iron Works Co., Birmingham.

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

1800 Tons, Burlington, N. J., power house extension for Public Service Electric & Gas Co.

1600 Tons, Washington, Ninth Street bridge over Pennsylvania Railroad tracks, bids Feb. 14.

900 Tons, Boston Navy shop building.

800 Tons, Quincy, Mass., Bethlehem Steel Co. Fore River machine shop.

700 Tons, Chester, Pa., plant addition for Philadelphia Electric Co.

500 Tons, Birdsboro, Pa., building for Birdsboro Steel Foundry & Machine Co.

425 Tons, Queens, New York, wholesale poultry market.

350 Tons, Pittsburgh and Pottstown, Pa., Government buildings.

300 Tons, Wellsville, N. Y., storage building for Sinclair Refining Co.

210 Tons, New York, asphalt plant for city.

200 Tons, Buffalo, building for Buffalo Shipbuilding Corp.

165 Tons, Monroe County, Pa., highway bridge.

150 Tons, Schenectady, N. Y., addition to axle shop for American Locomotive Co.

150 Tons, Buffalo, building additions for National Analine & Chemical Co.

125 Tons, Buffalo, store building leased to W. T. Grant Co.

115 Tons, Burnham, Pa., extension to cooling bed building, Standard Steel Works Division, Baldwin Locomotive Works.

105 Tons, Ithaca, N. Y., transformer testing building for Cornell University.

Unstated Tonnage, Niagara Falls, N. Y., factory buiding for E. I. du Pont de Nemours & Co. Cost estimated at $2,000,000.

THE SOUTH

3000 Tons, Huntington, W. Va., relocating bridges, U. S. Engineers flood project at Massillon, Ohio; bids March 25.

250 Tons, Petersburg, W. Va., State bridge.

190 Tons, Louisville, Ky., Parr's Restaurant Corp., Kresge store.

CENTRAL STATES

3500 Tons, Cleveland, plant for Thompson Products, Inc., previously reported as 800 tons; bids Feb. 12.

2300 Tons, Flint, Mich., car storage and drive away building for Buick Motor Co.

1200 Tons, Savanna, Ill., 137 underground magazines; bids Feb. 7.

900 Tons, Elwood, Ind., conveyor ramp for ordnance plant; bids taken.

750 Tons, Chicago, warehouse for Henry Ericsson Co.

675 Tons, Granite City, Ill., building and west leanto for General Steel Castings Corp.

600 Tons, Dayton, eight Air Corps warehouse units; bids Feb. 13.

400 Tons, Canton, Ohio, ordnance plant for Westinghouse Electric & Mfg. Co.

315 Tons, Erie, Kan., bridge over Neosha River.

Weekly Bookings of Construction Steel

Week Ended ——→	Feb. 4, 1941	Jan. 28, 1941	Jan. 7, 1941	Feb. 6, 1940	Year to Date 1941	Year to Date 1940
Fabricated structural steel awards	30,450	43,850	33,900	28,900	204,050	75,000
Fabricated plate awards	4,930	930	1,500	1,575	19,845	19,225
Steel sheet piling awards	295	655	1,655	2,000	3,250	2,250
Reinforcing bar awards	11,350	10,710	14,045	13,100	51,020	36,695
Total Letting of Construction Steel	47,025	56,145	51,100	45,575	278,165	133,170

275 **Tons**, East Peoria, Ill., factory addition for Caterpiller Tractor Co.
225 **Tons**, West Wichita, Kan., car repair shop for Santa Fe railroad.
220 **Tons**, Cleveland, addition to Upson Works, Republic Steel Corp.
215 **Tons**, Elwood, Ill., 10 railroad bridges for ordnance plant.
150 **Tons**, Flint, Mich., Bell Telephone Co. building.
140 **Tons**, Sterling, Ill., plant for Franz Mfg. Co.
130 **Tons**, Kansas City, Kan., three pumping stations for U. S. Engineer.
100 **Tons**, Saginaw, Mich., sewer project.

WESTERN STATES

10,000 **Tons**, Denver, Ordnance plant for War Department.
1800 **Tons**, Dutch Flat, Colgate, and Colfax, Cal., Pacific Gas & Electric Co. power houses.
450 **Tons**, Sunnyvale, Cal., Joshua Hendy Iron Works addition.
200 **Tons**, Tiburon, Cal., wharf, Navy Net Depot; J. Phillip Murphy Corp., San Francisco, erector.

CANAL ZONE

161 **Tons**, Panama Canal, grillage; bids Feb. 14 by general purchasing officer, Panama Canal, Washington.

FABRICATED PLATES

AWARDS

2700 **Tons**, Nantahala, N. C., penstock and surge tanks, to Chicago Bridge & Iron Co., Chicago.
1100 **Tons**, Wichita, Kan., 35 oil storage tanks, to Chicago Bridge & Iron Co., Chicago, through Winkler Koch Engineering Co.
400 **Tons**, Tuscon, Ariz., elevated tank at Municipal airport (Invitation 70), to Chicago Bridge & Iron Co., Los Angeles. Tonnage includes shapes.
350 **Tons**, Pacific Coast points, 44 peg top buoys for Navy, to Western Pipe & Steel Co., Los Angeles.
250 **Tons**, Moon Lake, Utah, Duchesne Power Plant penstocks and pipes, to Hardesty Mfg. Co., Denver, through Strong & Grant, Salt Lake City, contractors.
130 **Tons**, Southport, La., storage tanks for International Lubricant Corp., to Ingalls Iron Works Co., Birmingham.

PENDING PROJECTS

3000 **Tons**, Dutch Flat, Colgate, and Colfax, Cal., penstocks for Pacific Gas & Electric Co. power houses.
1672 **Tons**, Panama Canal, fabricated high strength low alloy steel; bids Feb. 14 by general purchasing officer, Panama Canal, Washington.

SHEET PILING

AWARDS

296 **Tons**, Jasper and Tyler Counties, Tex., State highway letting, to Bethlehem Steel Co., Bethlehem, Pa.

PENDING PROJECTS

1000 **Tons**, Huntington, W. Va., U. S. Engineers flood project, for Massillon, Ohio; bids March 25.
395 **Tons**, Paducah, Ky., flood prevention work for U. S. Engineer's Office, Louisville.

Reinforcing Steel

Awards of 11,350 tons; 3,125 tons in new projects.

AWARDS

ATLANTIC STATES

750 **Tons**, Everett, Mass., General Electric Co. supercharger unit, to Bethlehem Steel Co., Bethlehem, Pa.
333 **Tons**, Burlington and Camden Counties, N. J., road widening on route 43, to Truscon Steel Co., Youngstown, through F. A. Canuso & Sons.
180 **Tons**, Groton, Conn., additions to launchways for Electric Boat Co., to Truscon Steel Co., Youngstown.
120 **Tons**, Paterson, N. J., test cells at Wright Aeronautical plant, to Truscon Steel Co., Youngstown, through Mahoning Troast Construction Co.

SOUTH AND CENTRAL

1527 **Tons**, Wilmington, Ill., 201 igloos, to Truscon Steel Co.
650 **Tons**, Dearborn, Mich., Ford Motor aircraft building, to Truscon Steel Co., Youngstown, Ohio.
550 **Tons**, Charlestown, Ind., plant for E. I. duPont de Nemours Co., to Truscon Steel Co., Youngstown.
450 **Tons**, Chicago, Devon Campbell artesian building, to Truscon Steel Co., Youngstown, through Willarch.
225 **Tons**, Chicago, plant addition Chicago Flexible Shaft Co., to Ceco Steel Products Corp., Chicago.
215 **Tons**, Harrisburg, Ill., U. S. Engineers Office, to Laclede Steel Co., St. Louis, Mo.
220 **Tons**, Cleveland, Shaker Town House, Inc., apartment, to Truscon Steel Co., Youngstown.
150 **Tons**, Connell, Kan., WPA 6762, to Sheffield Steel Co., Kansas City, Mo.
125 **Tons**, Cleveland, hangar and engine propellor test house at Airport, to Truscon Steel Co., Youngstown.
117 **Tons**, Gadsden, Ala., shell forging plant to Truscon Steel Co., Youngstown, through Rust Engineering Co.
102 **Tons**, Medford, Okla., bridge project, to Sheffield Steel Corp., Kansas City, Mo.

WESTERN STATES

2500 **Tons**, Bremerton, Wash., Navy Yard fitting-out pier, to Bethlehem Steel Co., Seattle, through Puget Sound Bridge & Dredging Co., and Rumsey & Co., Seattle, contractors.
1000 **Tons**, Oakland, Cal., Navy airplane storage, to Pacific States Steel Corp., San Francisco, through Clinton Construction Co., San Francisco, contractor.
600 **Tons**, Ogden, Utah, two 37mm. shell loading plants at Ogden Ordnance Depot, to Colorado Builders Supply Co., Denver, through Olson Construction Co., and Dobson & Robinson, Lincoln, Neb., contractors.
315 **Tons**, French Camp, Cal., San Joaquin County hospital, to Gilmore Fabricators, Inc., San Francisco.
187 **Tons**, Earp, Cal., Parker power plant (Invitation A-44, 225-A), to Bethlehem Steel Co., San Francisco.
180 **Tons**, Burlingame, Cal., post office, to Ceco Steel Products Co., San Francisco, through H. H. Larsen, San Francisco, contractor.
179 **Tons**, San Francisco, Hunters Point Navy assembly shop (Specification 10,172), to Gilmore Fabricators, Inc., San Francisco, through Barrett & Hilp, San Francisco, contractors.
170 **Tons**, Yakima, Wash., court house, to Northwest Steel Rolling Mills, Seattle, through William S. Yeaman, Yakima, contractor.
169 **Tons**, Corbett, Wyo., Heart Mountain Division, Shoshone Project (Invitation 48.347-A), to Colorado Fuel & Iron Co., Denver.
105 **Tons**, Sacramento, Cal., warehouse, armament fire-control supply and repair building, and freight terminal at McClellan Field (Invitations CQM-6870-41-10, 11, and 12), to Herrick Iron Works, Oakland, Cal., through James I. Barnes, Santa Monica, Cal., contractor.
103 **Tons**, Los Angeles, Cal., boiler house and cold storage building at Camp San Louis, to Truscon Steel Co., Youngstown, through L. E. Dixon Co.
100 **Tons**, Seattle, fire wall for Richfield Oil Co., to Bethlehem Steel Co., Seattle, through Puget Sound Bridge & Dredging Co., Seattle, contractor.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

SOUTH AND CENTRAL

1000 **Tons**, Huntington, W. Va., U. S. Engineers, flood project, for Massillon, Ohio; bids March 25.
1000 **Tons**, Savanna, Ill., ordnance plant underground magazines; bids Feb. 7.
500 **Tons**, Chicago, Studebaker plant foundations; bids taken.
250 **Tons**, South Bend, Ind., Studebaker plant foundations; bids taken.
100 **Tons**, Columbus, boiler house and tunnel for Curtiss Wright Corp., bids in.

WESTERN STATES

575 **Tons**, Friant, Cal., Friant Dam (Invitation 48,759-A); bids Feb. 12.

Cast Iron Pipe

Everett, Mass., has readvertised for bids on 4000 ft. of 8-in. pipe, cement lined; bids rejected were: Warren Foundry & Pipe Co., $1.28 a ft.; R. D. Wood Co., $1.37; United States Pipe & Foundry Co., $1.30.

Hartford, Conn., Metropolitan District, has awarded 29,000 ft. of 4 to 20-in. pipe and 36 tons of fittings, all cement lined, and eight tons of unlined fittings to United States Pipe & Foundry Co., Boston.

Rensselaer Water Co., Rensselaer, N. Y., plans pipe lines for water system and other waterworks installation, bids to be asked early in spring; cost over $500,000. Barker & Wheeler, Albany, N. Y., are consulting engineers. Financing is being arranged.

North Madison, Ind., plans pipe lines for water system and other waterworks installation. Cost close to $40,000. H. B. Steeg & Associates, 129 East Market Street, Indianapolis, are consulting engineers.

Sheridan, Wyo., plans pipe line extensions and replacements in water system. Fund of about $79,000 has been arranged for this and sewage lines, and other municipal improvements.

La Mesa, Cal., has rejected bids recently received for 4, 6 and 8-in. centrifugal cast iron pipe for water system, and has authorized purchase in open market.

Fenton Public Supply District of St. Louis County, care of Harvey B. Cox, 706 Chestnut Street, St. Louis, attorney and representative, is being organized to install and operate pipe lines for water supply throughout Fenton area. Petition for organization will have hearing in Circuit Court Feb. 6. Robert Francis Denny Co., 8004 Bonhomme Avenue, Clayton, Mo., is consulting engineer. Surveys and estimates of cost are under way.

Niagara, Wis., asks bids until March 3 for water pipe lines and other waterworks installation, including elevated steel tank and tower. Fund of $55,000 is being arranged for work. Federal Engineering Co., Central Office Building, Davenport, Iowa, is consulting engineer.

Omro, Wis., has plans for pipe lines for water system and other waterworks installation. Cost about $125,000. Financing is being arranged through Federal aid. Jerry Donohue Engineering Co., 608 North Eighth Street, Sheboygan, Wis., is consulting engineer.

Pipe Lines

Harrison Oil Co., Gulf Building, Houston, Tex., plans steel pipe lines for oil transmission in connection with new marine loading terminal on Calcasieu ship channel at Hackberry, La., including submarine line across channel, construction of two wharves, dredging of two slips and other work. A pumping station will be built. Award for wharf construction, etc., has been let to J. S. Abercrombie Co., first noted address.

Bureau of Reclamation, Denver, asks bids until Feb. 25 for fabricated steel pipe for Grand Coulee hydroelectric power plant, Grand Coulee, Wash., including fittings, valves, etc. (Specifications 1475-D).

Southern Natural Gas Co., Watts Building, Birmingham, is considering new welded steel pipe line, as branch of present main pipe line, to connection with line of Chattanooga Gas Co., Chattanooga, Tenn., for natural gas transmission for distribution by last noted company. This will form part of expansion program of company, for which a total fund of more than $2,000,000 is being arranged.

Bureau of Reclamation, Washington, has awarded contract to Western Pipe & Steel Co., San Francisco, at $1,587,000 for four 15-ft. diameter welded steel penstocks for main units at Shasta Dam hydroelectric power station, Central Valley project, Cal., with branches to station service equipment, and all supports and appurtenances (Specifications 941).

Rockport, Tex., has low bid from N. A. Saigh Co., Builders' Exchange Building, San Antonio, Tex., at $51,575 for pressure pipe line system for municipal natural gas distribution. Horace J. Wilson, 130 West Woodlawn Avenue, San Antonio, is consulting engineer.

Prices of Finished Iron and Steel...

Steel prices on these pages are f.o.b. basing points (in cents per lb.) unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point → / ↓ Product	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	DELIVERED TO Detroit	New York	Philadelphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled[1]	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	
Long ternes[2]	3.80¢		3.80¢									4.55¢			
Wrought iron	4.75¢														
STRIP															
Hot rolled[3]	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢		
Cold rolled[4]	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.90¢		
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢								
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester = 3.35¢)					3.05¢		
TIN PLATE Standard cokes (Per 100-lb. base box)	$5.00	$5.00	$5.00						$5.10						
BLACK PLATE 29 gage[5]	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ (10)			
TERNES, M'FG. Special coated (Per base box)	$4.30		$4.30						$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel[6]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (billet)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢		
Reinforcing (rail)[7]	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢				2.40¢	2.45¢	2.15¢		
Cold finished[8]	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢							2.70¢		
PLATES															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	(Coatesville and Claymont = 2.10¢)		2.45¢	2.65¢		2.29¢	2.15¢
Wrought iron	3.80¢														
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	
Alloy	3.50¢	3.50¢			(Coatesville = 3.50¢)										
SHAPES Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	(Bethlehem = 2.10¢)				2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester = 3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester = 4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester = 6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8.35¢			(Worcester = 8.55¢)								
WIRE[9]															
Bright	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)								
Galvanized	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)								
Spring	3.20¢	3.20¢		3.20¢			(Worcester = 3.30¢)								
PILING Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			
IRON BARS Common		2.25¢			(Terre Haute, Ind. = 2.15¢)										
Refined	3.75¢														
Wrought	4.40¢														

[1] Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. [2] Unassorted 8-lb. coating. [3] Widths up to 12 in. [4] Carbon 0.25 per cent and less. [5] Applies to 29 gage within certain width and length limitations. [6] For merchant trade. [7] Straight lengths as quoted by distributers. [8] Also shafting. For quantities of 20,000 to 39,999 lb. [9] Carload lots to manufacturing trade. [10] Boxed.

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are $2 higher f.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

Shell Steel

Basic open hearth shell steel f.o.b. Pittsburgh and Chicago.

	Per Gross Ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity. This type of steel is for hot rolled sections used for the forging of shells and includes rounds, round squares, and special sections.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)	*Per Lb.*
Pittsburgh, Chicago, Cleveland	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

9/32 in. to 4/64 in., $3 a net ton higher. Quantity extras apply.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh; Package, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	$6.00	$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00
25-lb. coating I.C.	8.00	16.00
30-lb. coating I.C.	8.63	17.25
40-lb. coating I.C.	9.75	19.50

WIRE PRODUCTS

(To the Trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

	Base per Keg
Standard wire nails	$2.55
Coated nails	2.55
Cut nails, carloads	3.85
	Base per 100 Lb.
Annealed fence wire	$3.05
	Base Column
Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	56
Galvanized barbed wire†	70
Twisted barbless wire	70

*15½ gage and heavier. †On 80-rod spools in carload quantities.

Note: Birmingham base same on above items, except spring wire.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
½ in. and smaller by 6 in. and shorter	68
9/16 and ⅝ in. by 6 in. and shorter	66
¾ to 1 in. by 6 in. and shorter	64
1⅛ in. and larger, all lengths	62
All diameters over 6 in. long	62
Lag, all sizes	65
Plow bolts	68½
Hot pressed nuts; c.p.c., t-nuts; square, hex., blank or tapped:	
½ in. and smaller	66
9/16 to 1 in. inclusive	63
1⅛ to 1½ in. inclusive	61
1⅝ in. and larger	60

On above items, excepting plow bolts, additional allowance of 10 per cent for full container quantities.

On all of the above items there is an additional 5 per cent allowance for carload shipments.

Semi-fin. hexagon nuts	U.S.S.	S.A.E.
½ in. and smaller	66	70
9/16 to 1 in.	63	65
1⅛ in. through 1½ in.	61	62
1⅝ in. and larger	60	..

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose	73 and 100
Stove bolts in packages, with nuts attached	73
Stove bolts in bulk	81

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York, lots of 200 lb. or over.

Large Rivets

(½ in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$3.40

Small Rivets

(7/16 in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 10

Cap and Set Screws

	Per Cent Off List
Milled hexagon head, cap screws, 1 in. dia. and smaller	50
Milled headless set screws, cut thread ¼ in. and larger	64
3/16 in. and smaller	73
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	68
Upset set screws, cup and oval points	74
Milled studs	52

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Jan. 29	Jan. 30	Jan. 31	Feb. 1	Feb. 3	Feb. 4
Copper, Electrolytic[1]	12.00	12.00	12.00	12.00	12.00	12.00
Copper, Lake	12.00	12.00	12.00	12.00	12.00	12.00
Tin, Straits, New York	50.20	50.25	50.50	....	50.375	50.375
Zinc, East St. Louis	7.25	7.25	7.25	7.25	7.25	7.25
Lead, St. Louis[3]	5.35	5.35	5.35	5.35	5.35	5.35

[1] Mine producers' quotations only, delivered Conn. Valley. Deduct ¼c. for approximate New York delivery price. [2] Add 0.39c. for New York delivery. [3] Add 0.15c. for New York delivery.

Warehouse Products

Cents per lb., Delivered

	New York	Cleveland
Tin		
Straits pig	51.25	53.75
Copper		
Electro	12.75	14.00
Castings	12.50	13.50
H. R. Sheets*	20.12	20.12
Seamless tubes*	20.62	20.62
Brass		
Yellow sheets*	18.65	18.65
Yellow, rods*	13.67	13.67
Seamless tubes*	21.40	21.40
Zinc		
Slabs	Nom'al	Nom'al
Sheet, No. 9 casks	13.50	Nom'al
Lead		
American pig	6.50	6.00
Bar	8.45	8.50
Cut sheets	8.80	8.75
Antimony		
Asiatic	16.00	17.00
Aluminum		
Virgin, 99%	20.00	21.00
No. 1 remelt., 98-99%	18.00	18.50
Solder		
½ and ½	30.750	32.00
Babbitt		
Anti-friction grade	23.50	21.50

Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper		
Hvy. crucible	10.25	10.875
Hvy. and wire	9.25	9.65
Light and bottoms	8.25	8.75
Brass		
Heavy	6.00	6.55
Light	5.00	5.75
No. 1 yel. turn	7.00	7.50
No. 1 red or compo. turnings	9.00	10.00
Hvy. Mach. compo.	9.25	9.625
Lead		
Heavy	4.50	5.00
Aluminum		
Cast	Nom'l	Nom'l
Sheet	Nom'l	Nom'l
Zinc	Nom'l	Nom'l

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered: virgin, 99 per cent plus, 17c.-18c. a lb.; No. 12 remelt No. 2, standard, 17-17.50c. a lb. NICKEL electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt: Asiatic, 16.50c. a lb., New York; American, 13c. a lb., f.o.b. smelter. QUICKSILVER, $169-$170 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 13.25c. a lb.

*These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33⅓; on brass sheets and rods, 40; on brass tubes, 33⅓, and copper tubes, 40.

ALLOY STEEL

Alloy Steel Blooms, Billets and Slabs

Base per gross ton, f.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem $54.00

Alloy Steel Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade ..... 2.70c.
Delivered, Detroit ..... 2.80c.

S.A.E. Series Numbers	Alloy Differential, per 100 Lb.
2000 (1.5 Ni)	$0.35
2100 (1.5 Ni)	0.75
2300 (3.5 Ni)	1.70
2500 (5 Ni)	2.55
3100 Ni-Cr	0.70
3200 Ni-Cr	1.35
3300 Ni-Cr	3.80
3400 Ni-Cr	3.20
4100 Cr-Mo (0.15 to 0.25 Mo.)	0.55
4100 Cr-Mo (0.25 to 0.40 Mo.)	0.75
x4340 Cr-Ni-Mo	1.70
4340 Cr-Ni-Mo	1.85
4600 Ni-Mo (0.2-0.3 Mo, 1.5-2 Ni)	1.20
5100 (0.60-0.90 Cr)	0.35
5100 (0.80-1.10 Cr)	0.45
5100 Cr spring steel	0.15
52-100 Cr. (electric furnace)	2.60
6100 Cr-V bar	1.20
6100 Cr-V spring steel	0.85
C-V	0.85

The above differentials are for hot rolled finished products. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.35c. Delivered Detroit, 3.45c. carlots.

Alloy Steel Plates

Base per lb., f.o.b. Pittsburgh, Chicago and Coatesville.

Open hearth grade ..... 3.50c.

STAINLESS AND HEAT-RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chromium-Nickel

No.	304	302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium

No.	410	430	442	446
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
H'tstrip	17.00c.	17.50c.	24.00c.	35.00c.
C'ld st.	22.00c.	22.50c.	32.00c.	52.00c.

TOOL STEEL

(F.o.b. Pittsburgh)

	Base per Lb.
High speed	67c.
High-carbon-chromium	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

ELECTRICAL SHEETS

(F.o.b. Pittsburgh)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

Silicon strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago	$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. dock, San Francisco or Los Angeles or Seattle	56.00

Class "A" and gas pipe, $3 extra; 4-in. pipe is $3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $45 at Birmingham and $53.80 delivered Chicago.

GOOSE LAKE

Fire Clay and
Fire Clay Flour
Fire Clay Brick
Therm-O-Flake Insulation

Goose Lake Clay Deposit with Clay Grinding and Fire Brick Plant

Illinois Clay Products Company

JOLIET, ILL.

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld, Hot Rolled
1 in. o.d.	13 B.W.G. $9.01	$7.82	....
1¼ in. o.d.	13 B.W.G. 10.67	9.26	....
1½ in. o.d.	13 B.W.G. 11.70	10.23	$9.72
1¾ in. o.d.	13 B.W.G. 13.42	11.64	11.06
2 in. o.d.	13 B.W.G. 15.03	13.04	12.38
2¼ in. o.d.	13 B.W.G. 16.76	14.54	13.79
2¼ in. o.d.	12 B.W.G. 18.45	16.01	15.16
2½ in. o.d.	12 B.W.G. 20.21	17.54	16.58
2¾ in. o.d.	12 B.W.G. 21.42	18.59	17.54
3 in. o.d.	12 B.W.G. 22.48	19.50	18.35
3½ in. o.d.	11 B.W.G. 28.37	24.62	23.15
4 in. o.d.	10 B.W.G. 35.20	30.54	28.66
4½ in. o.d.	10 B.W.G. 43.04	37.35	35.22
5 in. o.d.	9 B.W.G. 54.01	46.87	44.25
6 in. o.d.	7 B.W.G. 82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb .or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought iron pipe)

Base Price = $200 Per Net Ton

Butt Weld

Steel	Black	Galv.
⅛ in.	56	36
¼ to ⅜ in.	59	43½
½ in.	63½	54
¾ in.	66½	58
1 to 3 in.	68½	60½

Wrought Iron	Black	Galv.
¼ and ⅜ in.	+9	+10
½ in.	24	6½
¾ in.	30	13
1 and 1¼ in.	34	19
1½ in.	38	21½
2 in.	37½	21

Lap Weld

Steel		
2 in.	61	52½
2½ and 3 in.	64	55½
3½ to 6 in.	66	57¼
7 and 8 in.	65	55½
9 and 10 in.	64½	55
11 and 12 in.	63½	54
Wrought Iron		
2 in.	30½	15
2½ to 3½ in.	31½	17½
4 in.	33½	21
4½ to 8 in.	32½	20
9 to 12 in.	28½	15

Butt weld, extra strong, plain ends

Steel	Black	Galv.
⅛ in.	54½	41½
¼ to ⅜ in.	56½	45½
½ in.	61½	53½
¾ in.	65½	57½
1 to 3 in.	67	60
Wrought Iron		
¼ and ⅜ in.	+10	+43
½ in.	25	9
¾ in.	31	15
1 to 2 in.	38	22½

Lap weld, extra strong, plain ends

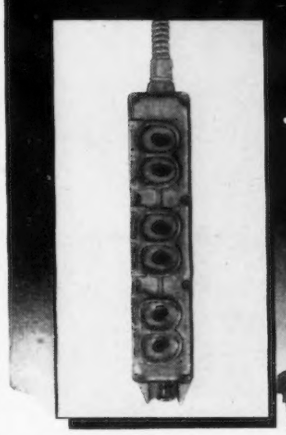
Steel		
2 in.	59	51½
2½ and 3 in.	63	55½
3½ to 6 in.	66½	59
7 and 8 in.	65½	56
9 and 10 in.	64½	55
11 and 12 in.	63½	54
Wrought Iron		
2 in.	33½	18½
2½ to 4 in.	39	25½
4½ to 6 in.	37½	24
7 and 8 in.	38½	24½
9 to 12 in.	32	20½

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher, on all butt weld 8 in. and smaller.

Push button control

MULTIPLE OR SINGLE SPEED *for* ELECTRIC CRANES AND HOISTS

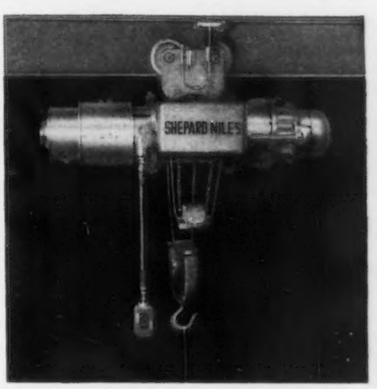


Shepard Niles multiple speed push button control for all 6 travel motions applied to 3-motor electric traveling crane.

SHEPARD NILES multiple speed push button control provides 5 selective speeds by one push button for each travel motion. Each button as it is pressed inward makes five electrical contacts, corresponding to five independent speeds in each direction of travel

Push button master switch cases are of aluminum alloy and made slender enough to be grasped easily with the hand. An assembly of two or three master switches in tandem can be furnished for the control of 2-motor and 3-motor cranes and hoists. An emergency stop switch is provided at the lower end of the assembly.

WRITE FOR BULLETIN No. 129



Shepard Niles LiftAbout equipped with single speed push button control.

A COMPLETE LINE OF CRANES & HOISTS

SHEPARD NILES CRANE & HOIST CORP.

356 SCHUYLER AVENUE . . . MONTOUR FALLS, N. Y.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, bessemer, 51.50%...	$4.75
Old range, non-bessemer, 51.50%	4.60
Mesaba, bessemer, 51.50%.....	4.60
Mesaba, non-bessemer, 51.50%.	4.45
High phosphorus, 51.50%.....	4.35

Foreign Ores*

C.i.f. Philadelphia or Baltimore, Exclusive of Duty

	Per Unit
Algerian, low P, Cu free, dry, 55 to 58% Fe	Nom.
Caucasian, washed, 52% Mn....Nom.	
African, Indian, 44 to 48% Mn....50c.	
African, Indian, 49 to 51% Mn....54c.	
Brazilian, 46 to 48% Mn.....50c.	
Cuban, del'd, duty free, 51% Mn..68c.	

	Per Short Ton Unit
Tungsten, Chinese, Wolframite, duty paid, delivered.....$23 to	$24
Tungsten, domestic, scheelite, delivered	$23.00
Chrome ore, lump c.i.f. Atlantic Seaboard, per gross ton: South African (low grade).....	Nom.
Rhodesian, 45%	$23.50
Rhodesian, 48%	27.50

Gives you *all* these advantages in a Magnetic Pulley for removing iron from foundry sand!

1. **Bronze Spacers and Coil Covers**—these do not short-circuit lines of force, reduce pulling power! (No other pulley is built this way. See what this means—Make the test shown.)

2. **Air-Cooled Construction**—a hot separator won't separate—the Dings pulley has more heat-radiating surface than any other pulley. Note the serrated radial openings, the longitudinal openings, the radiating vanes at the hub!

3. **Separate Coil Sections**—each coil section is cast separately, is a separate magnet. This insures maximum flux density, tremendous power!

4. **Mechanically Locked Coils**—failure from coil movement is eliminated. Coils are wound by experts according to A.I.E.E. standards.

5. **Waterproof Construction**—coils are impregnated with special insulating compound.

These features mean greater separating power, cleaner foundry sand, lower sand conditioning costs, better castings, more reclaimed metal. Write for catalog today.

Suspend a steel screw from string attached to support. Place steel spacer piece across pole ends of ordinary magnet—bronze or brass spacer across ends of similar magnet. With screw in center, move magnets toward each other at equal rate of motion.

Snap! Screw will jump and be firmly held at the bronze or brass spacer. Steel spacers short circuit magnetic lines of force and weaken the magnetic pull. Bronze spacers preserve magnetic strength—assure a stronger pull.

Bronze spacer rings are standard in Dings separators. Reason enough why Dings separators are the strongest separators on the market, size for size.

DINGS MAGNETIC SEPARATOR COMPANY

727 Smith Street Milwaukee, Wisconsin

Dings MAGNETIC SEPARATION HIGH INTENSITY

LIFTING MAGNETS • MAGNETIC CLUTCHES • SEPARATORS

RAILS, TRACK SUPPLIES

	F.o.b. Mill
Standard rails, heavier than 60 lb., gross ton.....	$40.00
Angle bars, 100 lb.....	2.70
F.o.b. Basing Points	
Light rails (from billets), gross ton	$40.00
Light rails (from rail steel), gross ton	39.00
	Base per Lb.
Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast.....	2.30c.
Track bolts, steam railroads...	4.15c.
Track bolts, discount to jobbers all sizes (per 100 counts)....	65-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneaqua, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

FLUORSPAR *Per Net Ton*

Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail...$20.00 to	$21.00
Domestic, f.o.b. Ohio River landing barges .....20.00 to	21.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines 20.00 to	21.00
Foreign, 85% calcium fluoride, not over 5% Si., c.i.f. Atlantic ports, duty paid.....	Nominal
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines....	31.00
As above, in bags, f.o.b. same mines	32.60

REFRACTORIES

Fire Clay Brick	*Per 1000 f.o.b. Works*
Super-duty brick at St. Louis..$60.80	
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey....	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois.....	42.75
Second quality, New Jersey....	49.00
No. 1 Ohio.....	39.90
Ground fire clay, per ton.....	7.10
Silica Brick	
Pennsylvania	$47.50
Chicago District	55.10
Birmingham	47.50
Silica cement, net ton (Eastern)	8.55
Chrome Brick	*Net per Ton*
Standard f.o.b. Baltimore, Plymouth Meeting and Chester..	$50.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	
Magnesite Brick	
Standard f.o.b. Baltimore and Chester $72.00	
Chemically bonded, f.o.b. Baltimore	61.00
Grain Magnesite	
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks).....(—)*	
Domestic, f.o.b. Baltimore and Chester in sacks	$40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

*None available.

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $120.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21% $36.00
Domestic, 26 to 28% 49.50

Electric Ferrosilicon

Per Gross Ton, Delivered, Lump Size

50% (carload lots, bulk) $74.50*
50% (ton lots, packed) 87.00*
75% (carload lots, bulk) 135.00*
75% (ton lots, packed) 151.00*

Bessemer Ferrosilicon

Per Gross Ton, F.o.b. Jackson, Ohio

10.00 to 10.50% $34.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2% $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton, F.o.b. Jackson, Ohio

5.00 to 5.50% $28.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots Lump Size, on Contract

4 to 6% carbon ..... 11.00c.
2% carbon ..... 17.50c.
1% carbon ..... 18.50c.
0.10% carbon ..... 20.50c.
0.06% carbon ..... 21.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon $113.00*
2.50% carbon 118.00*
2% carbon 123.00*
1% carbon 133.00*

Other Ferroalloys

Ferrotungsten, per lb. contained W, del. carload $2.00
Ferrotungsten, 100 lb. and less 2.25
Ferrovanadium, contract, per lb. contained V, del'd $2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., ton lots ..... $2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace, carload and contract, per net ton $142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract per net ton $157.50

*Spot prices are $5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton 58.50

Ferrophosphorus, electrolytic 23-26% in carlots, f.o.b. Monsato (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville 75.00

Ferromolybdenum, per lb. Mo, f.o.b. furnace ..... 95c.

Calcium molybdate, per lb. Mo, f.o.b. furnace ..... 80c.
Molybdenum oxide briquettes 48-52% Mo, per lb. contained Mo, f.o.b. Langeloth, Pa. 80c.

FUEL OIL

No. 3, f.o.b. Bayonne, N. J. ..... 4.50c.
No. 6, f.o.b. Bayonne, N. J. ..... 2.98c.
No. 5 Bur. Stds., del'd Chicago .. 3.25c.
No. 6 Bur. Stds., del'd Chicago .. 2.75c.
No. 3 distillate, del'd Cleveland .. 5.50c.
No. 4 industrial, del'd Cleveland . 5.00c.
No. 5 industrial, del'd Cleveland . 4.75c.
No. 6 industrial, del'd Cleveland . 4.50c.

Replace Gaskets Quickly and Easily *with* FLANGE-JACKS!

TO OPERATE FLANGE-JACKS

Remove opposite flange bolts, insert jaws of Flange-Jacks in holes and tighten. After removing other bolts, tighten down jack-screws together, separating flanges evenly.

GASKETS on existing pipe lines can be quickly and easily renewed with Flange-Jacks—a specially designed tool recently introduced by Garlock. No hammers . . . no chisels . . . no wedges . . . no broken flanges . . . no damaged faces . . . no pipe vibration . . . no dangerous sparks . . . no long shut-downs.

You just let Flange-Jacks do the work. Even if a joint is located where working space is cramped Flange-Jacks will open it easily. Write for descriptive folder!

THE GARLOCK PACKING COMPANY
PALMYRA, NEW YORK

In Canada: The Garlock Packing Company of Canada Ltd., Montreal, Que.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, prompt ..... $5.25 to $5.75

Foundry, f.o.b. Connellsville, prompt ..... $5.50 to $6.00

F'dry, by-product, Chicago 10.50

F'dry, by-product, New England 13.00

Foundry, by-product, Newark or Jersey City ..... $11.30 to $11.90

F'dry, by-product, Philadelphia. 11.13

F'dry, by-product, Cleveland.. 11.55

F'dry, by-product, Cincinnati 11.00

Foundry, Birmingham 7.50

F'dry, by-product, St. Louis $10.75 to $11.00

Foundry, from Birmingham, f.o.b. cars dock Pacific ports.. .. $14.75

BRITISH

British

Per Gross Ton, f.o.b. United Kingdom Ports

Ferromanganese, export £29 16s. 3d.

Tin plate, per base box. 32s. to 33s.

Steel bars, open hearth. £16 10s.

Beams, open hearth.... £15 8s.

Channels, open hearth . £15 8s.

Angles, open hearth.... £15 8s.

Black sheets, No. 24, gage £22 5s. max.* £22 5s. min.**

Galvanized sheets, No. 24 gage £25 12s. 6d. max.*; £25 12s. 6d. min.**

*Empire markets only.
**Other than Empire markets.

PIG IRON (Per Gross Ton)

Prices delivered various consuming points indicated by bold italics

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phos.
Boston	***$25.50***	***$25.00***	***$26.50***	***$26.00***	.....
Brooklyn	***27.50***	.....	.....	***28.00***	.....
Jersey City	***26.53***	***26.03***	***27.53***	***27.03***	.....
Philadelphia	***25.84***	***25.34***	***26.84***	***26.34***	.....
Bethlehem, Pa.	$25.00	$24.50	$26.00	$25.50	.....
Everett, Mass.	25.00	24.50	26.00	25.50	.....
Swedeland, Pa.	25.00	24.50	26.00	25.50	.....
Steelton, Pa.	.....	24.50	.....	.....	28.50
Birdsboro, Pa.	25.00	24.50	26.00	25.50	28.50
Sparrows Point, Md.	25.00	24.50	.....	.....	.....
Erie, Pa.	24.00	23.50	25.00	24.50	.....
Neville Island, Pa.	24.00	23.50	24.50	24.00	.....
Sharpsville, Pa.††	24.00	23.50	24.50	24.00	.....
Buffalo	24.00	23.00	25.00	24.50	28.50
Cincinnati	***24.44***	***24.61***	.....	***25.11***	.....
Canton, Ohio	***25.39***	***24.89***	***25.89***	***25.39***	.....
Mansfield, Ohio	***25.94***	***25.44***	***26.44***	***25.94***	.....
St. Louis	***24.50***	***24.02***	.....	.....	.....
Chicago	24.00	23.50	24.50	24.00	.....
Granite City, Ill.	24.00	23.50	24.50	24.00	.....
Cleveland	24.00	23.50	24.50	24.00	.....
Hamilton, Ohio	24.00	23.50	.....	24.00	.....
Toledo	24.00	23.50	24.50	24.00	.....
Youngstown††	24.00	23.50	24.50	24.00	.....
Detroit	24.00	23.50	24.50	24.00	.....
St. Paul	***26.63***	.....	***27.13***	***26.63***	.....
Duluth	24.50	.....	25.00	24.50	.....
Birmingham	19.38*	18.00	24.00	.....	.....
Los Angeles, San Francisco and Seattle	***27.50***	.....	.....	.....	.....
Provo, Utah	22.00	.....	.....	.....	.....
Montreal†	27.50	27.50	.....	28.00	.....
Toronto†	25.50	25.50	.....	26.00	.....

GRAY FORGE

Valley or Pittsburgh fce. $23.50

CHARCOAL

Lake Superior fce. $27.00
Delivered Chicago 30.34

Base prices are subject to an additional charge for delivery within the switching limits of the respective districts.

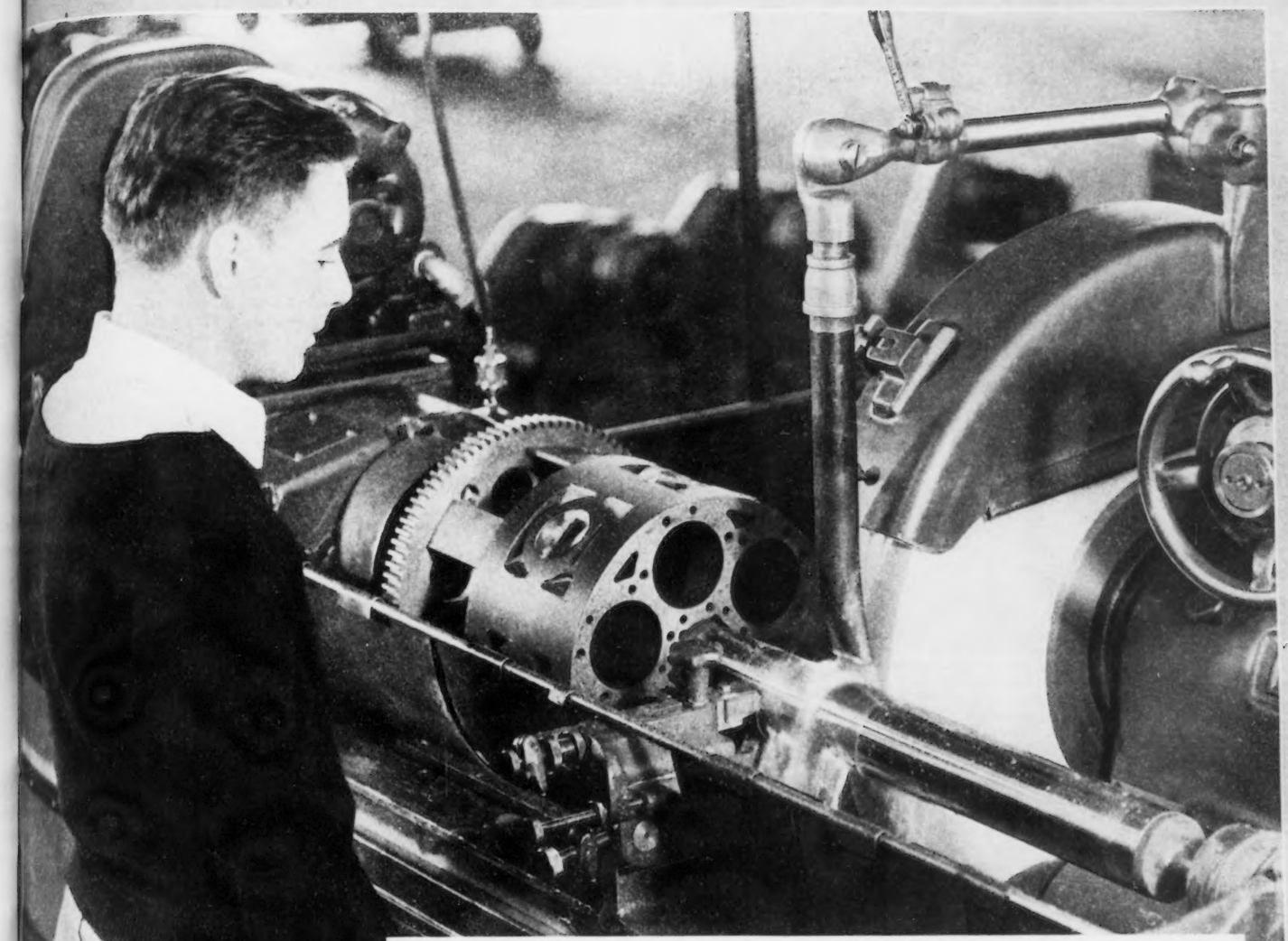
*Delivered prices on Southern iron for shipment to Northern points are 38c. a ton below delivered prices from nearest Northern basing point on iron with phosphorus content of 0.70 per cent and over. †On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

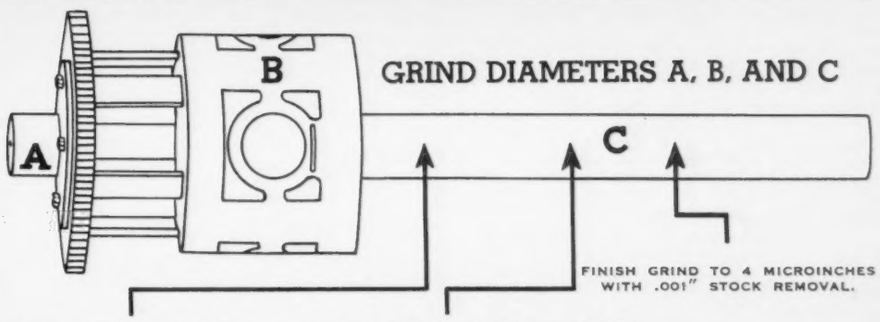
WAREHOUSE PRICES

(Base Prices, Dollars per 100 lb., Delivered Metropolitan Areas)

	Pittsburgh	Chicago	Cleveland	Philadelphia	New York	Detroit	Buffalo	Boston	Birmingham	St. Louis	St Paul	Milwaukee	Los Angeles
Sheets, hot rolled	$3.35	$3.05	$3.35	$3.55	$3.58	$3.23	$3.25	$3.51	$3.45	$3 39	$3.30	$3.48	$4.30
Sheets, cold rolled	....	4.10	4.05	4.05	4.40	4.30	4.30	4.58	....	4.12	4.35	4.43	6.50
Sheets, galvanized	4.75	4.60	4.62	4.90	5.00	4.64	4.75	5.11	4.75	4 87	4.75	4.98	5.25
Strip, hot rolled	3.60	3.40	3.50	3.95	3.96	3.48*	3.82	3.86	3.70	3.74	3.65	3.73	....
Strip, cold rolled	3.20	3.30	3.20	3.31	3.51	3.20	3.22	3.26	....	3.61	3.83	3.54	....
Plates	3.40	3.55	3.40	3.55	3.76	3.60	3.62	3.85	3.35	3.69	3.80	3.68	4.00
Structural shapes	3.40	3.55	3.58	3.55	3.75	3.65	3.40	3.85	3.55	3.69	3.80	3.68	4.15
Bars, hot rolled	3.35	3 50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.64	3.75	3.63	4.15
Bars, cold finished	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.43	4.02	4.34	3.88	6.60
Bars, ht. rld. SAE 2300	7.20	7.10	7.55	7.31	7.60	7.42	7.35	7.50	....	7.72	7.45	7.33	9.40
Bars, ht. rld. SAE 3100	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	....	6.02	6.00	5.88	8.55
Bars, cd. drn. SAE 2300	8.15	8.15	8 40	8.56	8.84	8.45	8.40	8.63	....	8.77	8.84	8.38	10.65
Bars, cd. drn. SAE 3100	6.75	6.75	7.75	7.16	7.19	7.05	6.75	7.23	....	7.12	7.44	6.98	9.80

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb.; galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; co'd finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb., galvanized sheets, 450 to 1499 lb.; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb., galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb.; Milwaukee, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 150 to 499 lb.; New York, hot rolled sheets, 0 to 1999 lb., cold rolled sheets, 400 to 1499 lb.; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, shapes, cold rolled sheets, 300 to 1999 lb., galvanized sheets, 150 to 1049 lb. Extras for size, quality, etc., apply on above quotations. *12 gage and heavier, $3.23.




B
A
C
GRIND DIAMETERS A, B, AND C
FINISH GRIND TO 4 MICROINCHES WITH .001" STOCK REMOVAL.
LIMIT .0003" ON DIAMETER WHICH IS 26" LONG.
ROUND AND PARALLEL WITHIN .00015" OVER ENTIRE 26" LENGTH.

SEVERE REQUIREMENTS
• • MET BY LANDIS • •

Recently a Landis 14" x 48" Type C Plain Hydraulic grinder was installed in the plant of a well known machine tool manufacturer in Connecticut. There it is being used to rough and finish grind carrier assemblies and is satisfactorily meeting very severe performance requirements. ○ ○ ○ Three diameters are ground on the carriers, of which one, the stem, is first rough ground removing .030" stock. The two other diameters are then ground to a good commercial finish after which the grinding wheel is changed for the finish grind on the stem. About .001" stock is removed within a limit of .0003"; however, the stem must be round and parallel within .00015" over its entire 26" length. A surface finish of 4 microinches is required. ○ ○ ○ Such satisfactory results on a job so demanding invite your investigation. Why not give Landis a chance to meet YOUR requirements? 363

PRECISION LANDIS GRINDERS

LANDIS TOOL CO.
WAYNESBORO, PENNSYLVANIA.

Sales Possibilities

. . . CONSTRUCTION, PLANT EXPANSION AND EQUIPMENT BUYING

North Atlantic States

• **General Electric Co.**, Lynn Works, Lynn, Mass., will begin superstructure at once for one-story addition, 86 x 600 ft., for which a number of separate contracts recently have been awarded for erection. Cost over $450,000 with equipment.

C. H. Cowdrey Machine Works, Inc., Fitchburg, Mass., special machinery and parts, has let general contract to Littlehale & Fisher Co., 49 Osgood Street, for one-story addition, 90 x 280 ft. Cost close to $100,000 with equipment.

Perkins Machine & Gear Co., Springfield, Mass., plans expansion, including installation of equipment for production of aircraft engine parts for Navy Department. Cost about $365,000. Financing has been arranged through Government.

Veeder-Root, Inc., 20 Sargent Street, Hartford, Conn., counting devices, parts, stampings, die-castings, etc., has asked bids on general contract for three-story and basement addition, 100 x 120 ft. Cost close to $200,000 with equipment. Buck & Buck, Inc., 650 Main Street, is architect and engineer.

Waterbury Tool Co., East Aurora Street, Waterbury, Conn., hydraulic transmissions, parts, etc., has let general contract to Austin Co., Cleveland, for two-story addition, 60 x 140 ft., for storage and distribution. Cost close to $85,000 with equipment.

Hartford Machine Screw Co., Capitol Avenue, Hartford, Conn., screw machine products, plans expansion, including equipment for production of aircraft engine parts for Navy Department. Cost about $469,000, fund in that amount to be secured from Government.

Brewster Aeronautical Corp., 6 East Forty-fifth Street, New York, airplanes and parts, plans new branch plant at Hatboro, Pa., where about 400 acres has been acquired near municipal limits. It will be used for assembling fighter and bomber type planes. Cost close to $2,000,000 with machinery. Additional structures will be built later.

American Brake Shoe & Foundry Co., 230 Park Avenue, New York, plans one-story addition to branch plant at 2001 Laurens Street, Baltimore, 80 x 320 ft., for expansion in foundry. Cost over $100,000 with equipment.

A. & P. Food Stores, Inc., 420 Lexington Avenue, New York, has leased new one-story building, about 120,000 sq. ft., to be erected on Grand Avenue, Maspeth, L. I., and will use for baking plant, and storage and distribution of meat and other food products. Cost about $500,000 with traveling ovens, mixers, conveyors, loaders and other mechanical-handling equipment. Brown & Matthews, Inc., 122 East Forty-second Street, New York, is contractor; Evans, Moore & Woodbridge, 101 Park Avenue, New York, are architects.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until Feb. 10 for 20 2-kw. and 10 ½-kw. power units (Circular 500).

Foster-Wheeler Corp., 165 Broadway, New York, machinery for oil refineries, power plant equipment, etc., has let general contract to Wigton-Abbott Corp., 60 East Forty-second Street, for one-story boiler shop at branch plant at Carteret, N. J., 93 x 200 ft. Cost close to $100,000 with machinery.

General Electric Co., Schenectady, N. Y., will begin superstructure for one-story addition, 400 x 780 ft., for which general contract recently was let to United Engineers & Constructors, Inc., 1401 Arch Street, Philadelphia. Cost over $850,000 with equipment.

Sterling Engine Co., 1270 Niagara Street, Buffalo, gas and gasoline engines and parts, plans one-story addition, about 100,000 sq. ft. of floor space, for assembling of marine engines for Navy Department. Cost close to $500,000 with machinery.

Doehler Die-Casting Co., 386 Fourth Avenue, New York, has let general contract to F. Gleason Co., 108 Colvin Street, Rochester, N. Y., for one-story addition to branch plant at Batavia, N. Y., about 200 x 200 ft., with extension, 50 x 200 ft. Cost close to $200,000 with equipment. G. Morton Wolfe, 1377 Main Street, Buffalo, is architect and engineer.

Moore Steam Turbine Corp., Wellsville, N. Y., a division of Worthington Pump & Machinery Corp., Harrison, N. J., has let general contract to Austin Co., Cleveland, for one-story addition. Cost about $60,000 with equipment.

Acme Metal Products Corp., 1845 West Seventy-fourth Street, Chicago, steel kitchen cabinets, etc., has purchased part of former stove and furnace plant of Richardson & Boynton Co., Dover, N. J., about 125,000 sq. ft. of floor space, and will modernize for new Eastern branch plant, with facilities for employment of about 350 men.

American Radiator & Standard Sanitary Corp., 40 West Fortieth Street, New York, has let general contract to Eastern Construction Co., Inc., 705 Greenwood Avenue, Trenton, N. J., for three one-story additions to sanitary ware-manufacturing plant at Hutchinson Mills, near Trenton, 270 x 560 ft., 300 x 500 ft., and 210 x 240 ft. Cost close to $1,000,000 with tunnel kiln and equipment. Prack & Prack, Martin Building, Pittsburgh, are architects.

Worthington Pump & Machinery Corp., 401 Worthington Avenue, Harrison, N. J., has approved plans for one-story addition, 35 x 79 ft., for a welding shop. Cost about $50,000 with equipment. Company also has work nearing completion on one-story addition for assembling refrigerating units. Cost close to $100,000 with machinery.

Elizabethtown Consolidated Gas Co., 16 West Jersey Street, Elizabeth, N. J., plans addition, 90 x 100 ft., to artificial gas plant on Erie Street, with installation of new gas generator and auxiliary equipment. This will be first of three new generators to be installed, increasing output by about 15,000,000 cu. ft. daily. Work will begin in March. Cost close to $250,000 with equipment.

Wright Aeronautical Corp., Paterson, N. J., has let general contract to John W. Ferguson Co., 152 Market Street, Paterson, for new one-story plant, 120 x 150 ft., on State Highway 6, near Caldwell, N. J., for parts production. Cost close to $200,000 with equipment. Albert Kahn Associated Architects & Engineers, Inc., Detroit, is architect and engineer.

Hudson Coal Co., 424 Wyoming Avenue, Scranton, Pa., plans one-story mechanical and repair shop, 38 x 160 ft., at Pine Ridge Colliery, near Wilkes-Barre, Pa. Cost over $65,000 with equipment.

Leeds & Northrup Co., 4901 Stenton Avenue, Philadelphia, electrical measuring instruments and parts, has let general contract to Arnold Bowen, 1110 Edgewood Road, Brookline, Pa., for one and two-story addition. Cost about $150,000 with equipment, instead of smaller sum previously noted. Richard Erskine, 1716 Cherry Street, is architect.

Warner Steel Co., Fullerton, Pa., has approved plans for remodeling and extending former local machine shop of Fuller-Lehigh Co. for production of fabricated steel specialties and stainless steel products. Cost close to $100,000 with equipment.

Lewis Foundry & Machine Division, Blaw-Knox Co., Farmers' Bank Building, Pittsburgh, has approved plans for one-story addition, 57 x 200 ft., to plant at Groveton, Pa., for expansion in machine shop. Cost close to $100,000 with machinery.

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 10 for steel bolts and miscellaneous parts (Schedule 4762).

Lancaster Iron Works, Inc., Lancaster, Pa., has begun construction of new shipbuilding plant at Frenchtown, Md., to include four shipways, shops and other structures, primarily for construction of steel barges for commercial service.

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until Feb. 10 for fractionating columns (Circular 907); until Feb. 11, steel storage tanks (Circular 909); until Feb. 12, shell conveyors, filling machines, pallet return conveyors and shell transfer conveyors (Circular 866).

Calvert Distilling Co., Relay, near Baltimore, has approved plans for one-story addition, about 50 x 200 ft., for storage and distribution. Cost over $60,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 11 for 17 hand-type cable splicers (Schedule 5051), four cable-testing machines (Schedule 5056), six motor-driven glass-edging machines and equipment (Schedule 5069); until Feb. 13, composition pipe fittings (Schedule 5010), iron pipe fittings (Schedule 5028); until Feb. 14, five motor-driven brake-drum lathes (Schedule 5079); anchor chains, swivel slots and shackle tools (Schedule 5082) for Eastern and Western yards.

The South

• **Mexican Petroleum Corp.**, 122 East Forty-second Street, New York, plans expansion and improvements in oil refinery at Savannah, Ga., including additional equipment in distillation unit; new 500-hp. boiler and auxiliary equipment in power house, and construction of steel tank units to increase storage capacity over 100,000 bbl. Cost close to $100,000.

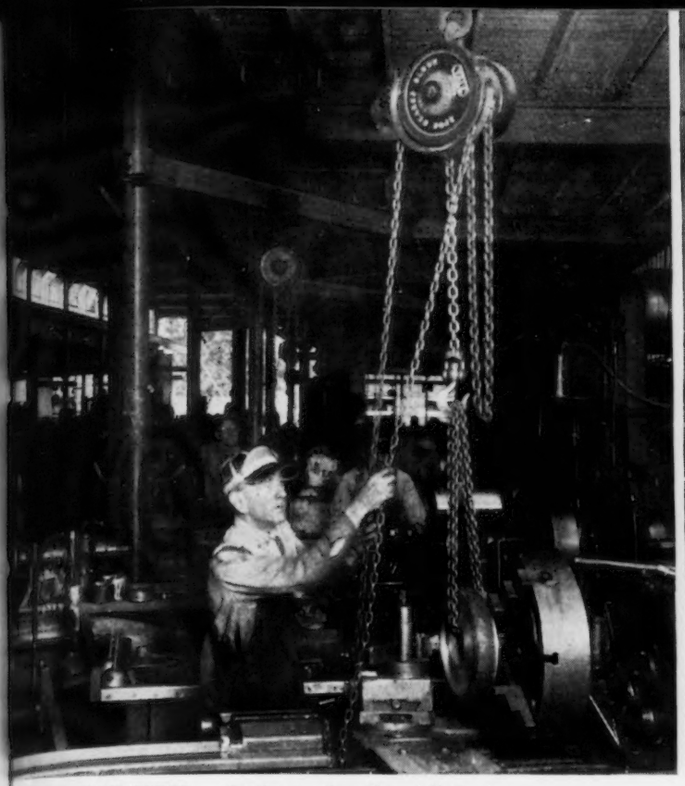
George T. Stagg Co., Frankfort, Ky., affiliated with Schenley Distillers Corp., 350 Fifth Avenue, New York, has let general contract to Frank Messer & Sons, Inc., 2515 Burnet Avenue, Cincinnati, for five-story addition for storage and distribution. Cost over $150,000 with equipment.

Alabama Power Co., Birmingham, is arranging fund of about $6,500,000 for expansion and improvements in plants and system during 1941, including power stations, substations, transmission and distributing lines, and other structures. Of amount noted, about $2,200,000 will be used for completion of new steam-electric generating station at Chickasaw, near Mobile, Ala.

War Department, Washington, has let contracts to H. K. Ferguson Co., Cleveland, and Oman Construction Co., Nashville, Tenn., on cost-plus-fixed-fee basis for new ammunition-loading plant at Milan, Tenn., to be known as Wolf Creek Ordnance Plant. It will include machine and mechanical shops, power house, pumping station and other structures. Entire project will cost about $14,000,000. Plant will be operated by Procter & Gamble Defense Corp., Cincinnati, recently organized subsidiary of Procter & Gamble Co.

Dallas Aviation School and Air College, 3300 Love Field Drive, Love Field airport, Dallas, plans new aviation school at Curtis Field, Brady, Tex., with hangar, shops, etc. Cost close to $200,000 with equipment.

Houston Shipbuilding Corp., Houston, Tex., recently organized subsidiary of Todd Shipyards Corp., New York, has leased Irish Island in Houston ship channel for new shipbuilding plant for construction of ocean-going vessels for Maritime Commission, Washington. Plant will include six shipways, outfitting dock, piers, one-story construction and mechanical



HAND CHAIN HOISTS Ball-Bearing Spur-Geared Hoists of this type are available in capacities from 300 lbs to 40 tons

ELECTRIC INDUSTRIAL TRUCKS Capacities up to 50,000 lbs. A wide range of types includes multiple-lift, high-lift and low-lift models for every need. For different jobs there are platform, fork, dump, ram, load carrier, and crane trucks.

CONTROLLED Materials Handling brings lowered costs to Metal-Working Plants

EVERY plant today has a two-fold job to do: producing normal goods and services, and supplying materials for our national defense. As this task is executed, it's amazing to see how materials handling affects plant operations.

In studying problems of production, executives find that the key to lowered costs frequently lies in the control exercised over materials handling operations.

Materials handling is a broad term. But actually it resolves itself into the problem of lift and shift.

On this page we present four different types of modern materials handling equipment. While each is different in form and function, each is the ultimate in the efficient application of mechanized control over lift and shift. Each is a study of how to eliminate wasted time and effort, and to increase plant productivity.

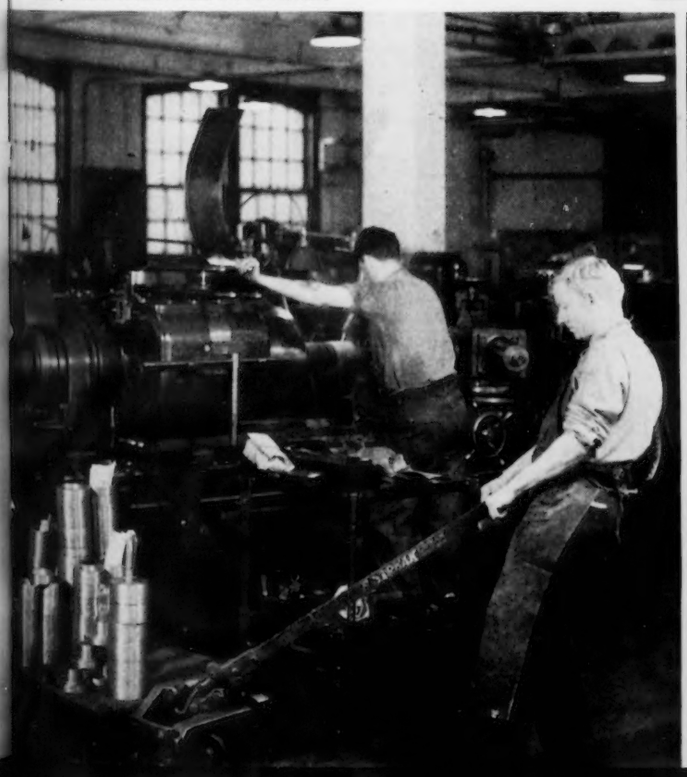
Hand and electric hoists, hand lift trucks, and electric industrial trucks bring to handling jobs increased efficiency, reduced costs, minimum maintenance, maximum flexibility and availability, plus increased speed, greater safety and a continuous flow of the materials in production.

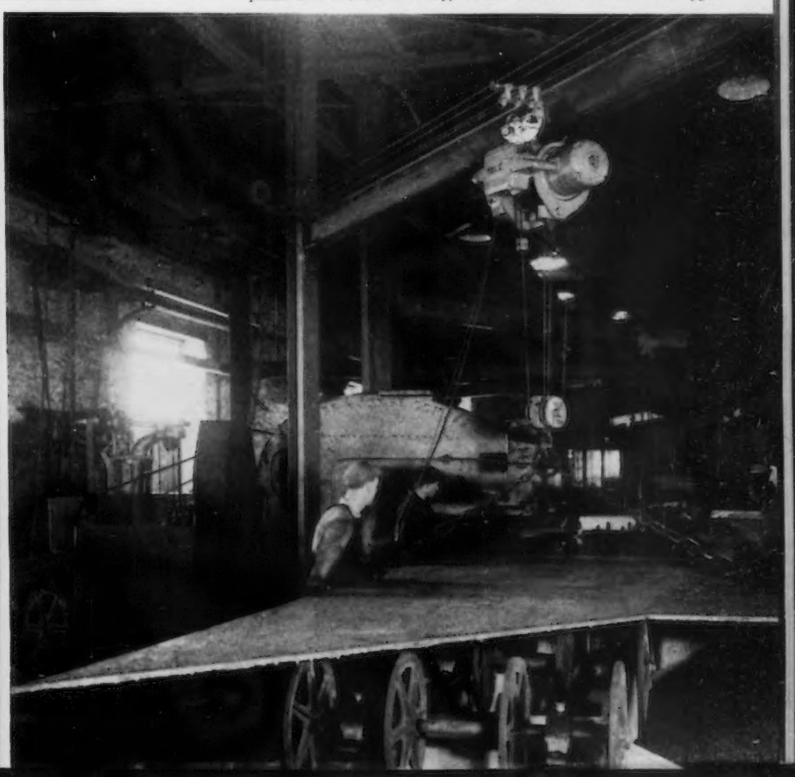
For specific details regarding any of this equipment, or for information concerning any materials handling problem, get in touch with, or write to, The Yale & Towne Manufacturing Company, Philadelphia Division, Philadelphia, Pa.

HAND LIFT TRUCKS Capacities up to 20,000 lbs. Single or multiple stroke lifts give these trucks an increased range of utility where heavier loads are concerned.

YALE

ELECTRIC WIRE ROPE HOISTS . . Capacities ¼ to 10 tons. Supplied in parallel and right angle suspensions in lug, hook, plain and motored trolley, close headroom and winch types.





shops, boiler house and auxiliary structures, and will cost about $4,680,000 with equipment, in which amount company has arranged financing with Government.

Petroleum Rectifying Co. of California, Inc., Petroleum Building, Houston, Tex., has let general contract to Schneider Construction Co., 4317 Roseland Street, for new one-story oil plant on eight-acre tract on Wayside Drive, consisting of three main units, including one-story structure, 50 x 208 ft., for storage and distribution, and auxiliary buildings. Cost over $80,000 with equipment.

Central States

• **Ilsco Copper Tube & Products, Inc.,** 5629 Madison Road, Cincinnati, plans new one-story plant, 90 x 240 ft., in Westover district, Mariemont. Cost over $125,000 with equipment. Felsberg & Gillespie, Ingalls Building, are architects.

John Deere Plow Co., 130 East Naughten Street, Columbus, Ohio, will take bids early in March for new one-story factory branch, storage and distributing plant, with shop building, at Chambers and Olentangy River Roads. Cost close to $60,000 with equipment.

Commanding Officer, Erie Proving Ground, LaCarne, Ohio, asks bids until Feb. 10 for two three-drum bent watertube boilers, with underfeed stokers, for power house at local military reservation, Erie Township, Ottawa County (Circular 28).

Rahn-Larmon Co., 2941 Spring Grove Avenue, Cincinnati, lathes, parts and other tools, has let general contract to Edward A. McCarthy & Sons, 1212 Race Street, for new one-story plant, 150 x 350 ft., at Central Parkway and Sassafras Street. Cost close to $350,000 with equipment. Charles T. Kennedy, 870 Ridgeway Avenue, is architect.

Westinghouse Electric & Mfg. Co., East Pittsburgh, has begun erection of one-story addition to branch plant at 1216 West Fifty-eighth Street, Cleveland, for expansion in manufacturing, storage and distribution facilities. General contract was let recently to H. K. Ferguson Co., Cleveland. Cost about $225,000 with equipment.

General Electric Co., Lamp Department, Nela Park, Cleveland, has let general contract to Sessinghaus & Ostergaard, Inc., 1115 Peach Street, Erie, Pa., for one-story plant on part of 10-acre tract at Conneaut, Ohio, for production of lamp bases and allied specialties, with storage and distributing unit. Cost about $250,000 with equipment.

Studebaker Corp., South Bend, Ind., has low bid from William E. O'Neil Construction Co., 2751 Clybourne Avenue, Chicago, for new one-story plant at end of Chippewa Avenue, with main unit, 762 x 1147 ft., and several auxiliary buildings, for assembling Wright airplane engines for War Department, which will hold title to property. Cost over $10,000,000 with machinery. Giffels & Vallet, Inc., Marquette Building, Detroit, is architect and engineer.

Atlas Tool & Mfg. Co., 5147 Natural Bridge Avenue, St. Louis, has let general contract to William H. & Nelson Cunliff Co., 3320 Lindell Boulevard, for two-story addition, 90 x 110 ft. Cost close to $60,000 with equipment.

Bendix Aviation Corp., South Bend, Ind., airplane instruments and other aircraft equipment, has let general contract to Bryant & Detwiler Co., Penobscot Building, Detroit, for one-story addition to branch plant at Wayne, Mich. Cost reported over $100,000 with equipment.

Kelsey-Hayes Wheel Co., Inc., 3600 Military Avenue, Detroit, steel automobile wheels and kindred equipment, has let general contract to W. E. Wood Co., 4649 Humboldt Avenue, for new plant on Plymouth Road, with main unit one-story, 280 x 850 ft., boiler house and auxiliary structures. Cost close to $1,000,000 with equipment. Giffels & Vallet, Inc., Marquette Building, is architect and engineer.

Republic Aircraft Products Corp., 5914 Federal Street, Detroit, division of Aviation & Transportation Corp., New York, plans one-story addition for production of aircraft engine parts for Navy Department, which will provide fund of about $532,000 for project.

Campbell-Wyant-Cannon Foundry Co., Muskegon Heights, Mich., automotive castings, has purchased one-story foundry at Muskegon, formerly held by Shaw-Box Crane & Hoist Division of Manning, Maxwell & Moore, Inc., and will improve for expansion. It is understood plant will be used for production of cast steel shells for Government under new casting process.

Buick Motor Car Co., Flint, Mich., plans new plant at Melrose Park, near Chicago, where 125 acres has been acquired, for production of Pratt & Whitney aircraft engines for Government. It will comprise main one-story unit, about 1,000,000 sq. ft. of floor space, for parts production and assembling and smaller structures, with power house. Cost over $30,000,000, fund to be secured through Government for project.

Ohmite Mfg. Co., 4835 West Flournoy Street, Chicago, electrical equipment, has asked bids on general contract for one-story addition, 125 x 125 ft., and improvements in present plant. Cost over $100,000 with equipment. Alfred S. Alschuler & Ralph N. Friedman, Inc., 28 East Jackson Boulevard, is architect.

Westclox Division of General Time Instruments Corp., LaSalle, Ill., clocks, clock mechanisms, etc., has let general contract to V. Jobst & Sons, Inc., Lehmann Building, Peoria, Ill., for new one and three-story plant, about 200 x 300 ft., and smaller three-story structure, at Peru, Ill. Cost close to $175,000 with equipment.

City Council, Osage, Iowa, asks bids until Feb. 18 for new municipal power plant, including three diesel engine-generating units with gross rating of 1300-kw., fuel tank and auxiliary equipment. Hubbard Engineering Co., 80 East Jackson Boulevard, Chicago, is consulting engineer.

Nordberg Mfg. Co., 3073 South Chase Avenue, Milwaukee, engines, compressors, parts, etc., has plans by Austin Co., 510 North Dearborn Street, Chicago, for nine one-story additions, close to 200,000 sq. ft. of floor space, for production of torpedo tubes for Navy Department, erection to begin this month. Cost over $750,000 with equipment.

Lion Mfg. Co., Inc., 2640 Belmont Avenue, Chicago, vending machines, parts, etc., has let general contract to Coath & Goss, Inc., 228 North LaSalle Street, for one-story addition, 100 x 100 ft. Cost about $90,000 with equipment. Engineering Systems, Inc., 221 North LaSalle Street, is architect and engineer.

City Council, Muscatine, Iowa, asks bids until Feb. 19 for extensions and improvements in municipal power plant, including new steam-generating unit, rated capacity of 100,000 lb. per hr., pulverized coal-burning equipment, and accessories; also alternate bids for multiple retort underfeed stoker, with coal as fuel. Stanley Engineering Co., Muscatine, is consulting engineer.

Western States

• **California Shipbuilding Co.,** Los Angeles, recently organized as an interest of Bechtel-McCone-Parsons, Inc., 601 West Fifth Street, engineer; Todd Shipyards Corp., 1 Broadway, New York, and other interests, plans new shipbuilding plant on West Basin, Los Angeles harbor, comprising eight shipways, outfitting pier, docks, metal-working shop, boiler house and other structures, for construction of 30 cargo vessels for Maritime Commission, Washington. Cost about $5,000,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 11 for six diesel engine drives for centrifugal pumps, two starting air equipments with motor-driven air compressor, three electric starters, two oil purifiers, one main diesel oil storage tank, one-day capacity diesel fuel tank, lubricating oil tank and one surge tank (Schedule 5045) for Mare Island Navy Yard.

Rheem Mfg. Co., Richmond, Cal., steel barrels, drums, etc., plans new one-story plant near Stockton, Cal., for production of tools, dies, etc., with large experimental laboratory. Cost over $100,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, plans new one-story instrument shop at Puget Sound Navy Yard, Bremerton, Wash., to cost $350,000 with equipment; also new one-story storehouse and distributing building, cost about $1,400,000 with mechanical-handling and other facilities; relocation and improvements in several shops, cost about $250,000, and new pier, cost about $2,400,000. Appropriations are being arranged.

Keystone Tool & Supply Co., 7720 Maie Avenue, Los Angeles, has applied to Los Angeles Harbor Commission for lease of about 18 acres near mouth of main channel in harbor area, for new shipbuilding plant. Yard will include four 500-ft. shipways, outfitting pier, shops and other structures. Cost about $500,000.

Payne Furnace & Supply Co., 339 North Maple Drive, Beverly Hills, Cal., domestic furnaces, parts, etc., has approved plans for one-story L-shaped addition, 68 x 325 ft., about 30,100 sq. ft. of floor space. Cost over $85,000 with equipment. Marshall P. Wilkinson, 6807 Hawthorne Avenue, Hollywood, Cal., is architect.

Canada

• **Flexible Shaft Co., Ltd.,** 321 Weston Road, Toronto, Ont., has asked bids on general contract for one-story addition. Cost about $60,000 with equipment. E. L. Sheppard, 57 Queen Street West, is architect.

Outboard Marine & Mfg. Co. of Canada, Ltd., Monaghan Road, Peterborough, Ont., marine engines, parts and kindred equipment, will take bids soon on general contract for one-story addition, about 100 x 150 ft. Cost approximately $115,000 with equipment. W. & W. R. L. Blackwell, Bank of Commerce Building, are architects.

A. C. Wickman (Canada), Ltd., subsidiary of A. C. Wickman, Ltd., a British firm specializing in hard metal development, has acquired 25 acres on Queen Street, Etobicoke Township, Ont., for erection of a factory for manufacture of tipped tools. Proposed plant will provide 31,000 sq. ft. of floor space. R. J. Hibbs Construction Co., Ltd., 15 Trent Avenue, Toronto, is general contractor and Hanks & Irwin, 2890 Bloor Street West, Toronto, architects. W. T. Muirhead, Park Plaza Hotel, Bloor and Avenue Road, Toronto, is local representative of company.

Allied War Supply Corp., Ltd., 420 Lagauchetiere Street West, Montreal, a company owned by the Canadian government, will start work this month on erection of a munitions plant in province of Quebec, to cost approximately $10,000,000.

Atlas Steels, Ltd., Main Street, Welland, Ont., has plans by F. W. Warren, Huron and Erie Building, Hamilton, Ont., for a factory building. Additions to electric furnace capacity and other extensions for alloy steel making will cost $5,500,000 financed by the Federal government.

Montreal Locomotive Works, Ltd., Longue Pointe, Montreal, in connection with $1,000,000 plant addition has awarded following contracts: General construction, Sutherland Construction Co., Ltd., 1440 St. Catharine Street West; structural steel, Dominion Bridge Co., Ltd., Lachine, Que.; six electric overhead cranes, Dominion Bridge Co., Ltd.; six electric overhead cranes, Herbert Morris Crane & Hoist Co., Ltd., 180 Valley Street. Engineers, T. Pringle & Sons, Ltd., 485 McGill Street.

Dominion Oxygen Co. of Canada, Ltd., 305 Bourgeois Street, Montreal, has awarded general contract to Foundation Co. of Canada, Ltd., 1538 Sherbrooke Street West, for plant additions to cost $75,000 with equipment.

English Electric Co. of Canada, Ltd., George Street, St. Catharines, Ont., has let number of sub-trades in connection with $300,000 plant addition for manufacture of electrical machinery, equipment, etc. Redfern Construction Co., Ltd., 36 Toronto Street, Toronto, is general contractor. T. H. Wiley, 186 St. Paul Street, St. Catharines, is architect.

B. F. Goodrich Rubber Co. of Canada, Ltd., 251 King Street West, Kitchener, Ont., has plans by Prack & Prack, architects, 36 James Street South, Hamilton, for plant addition, to cost with equipment about $100,000.